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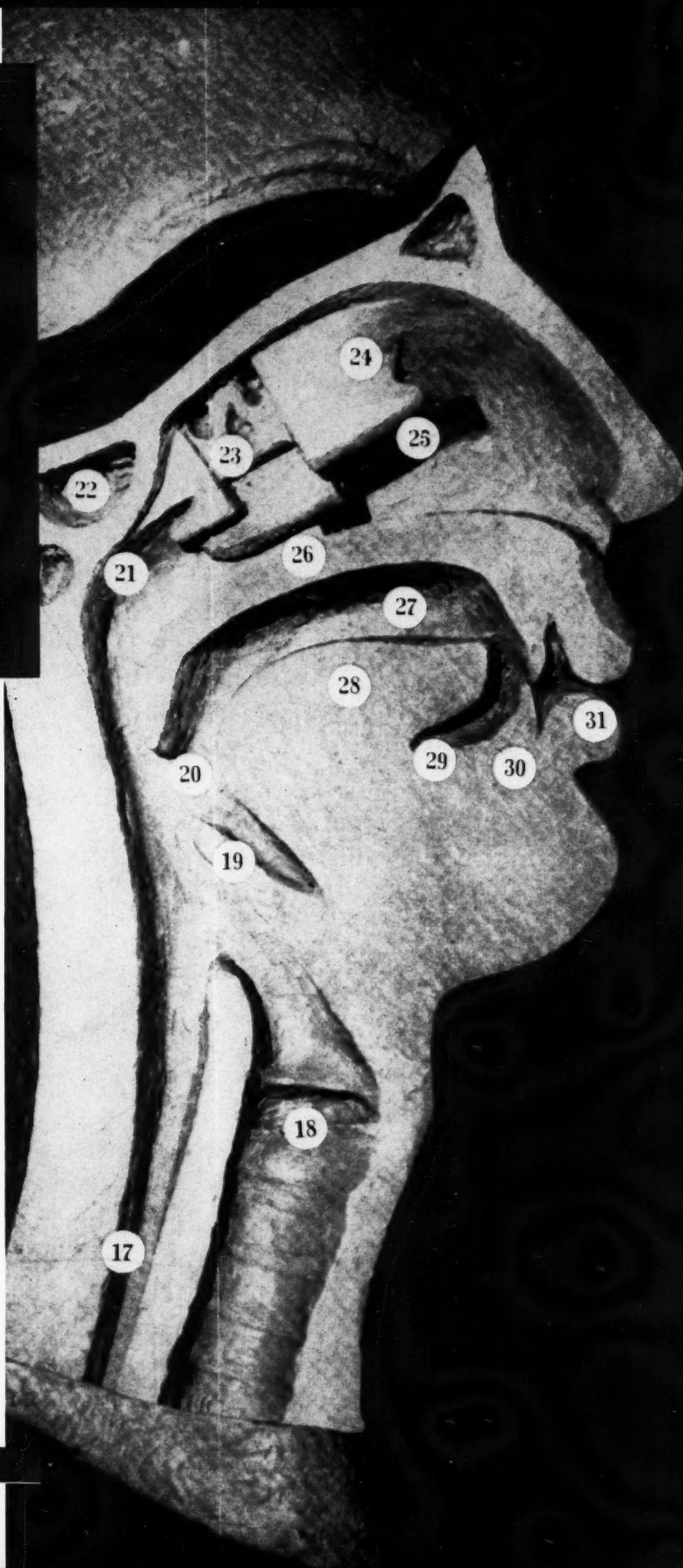
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**February 1951**

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NOTE: MEASUREMENTS FOR CENTRALS ARE GIVEN

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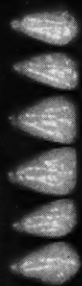
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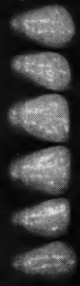
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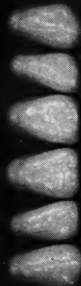
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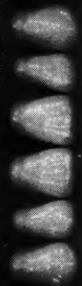
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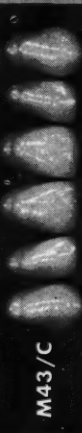
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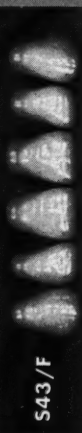
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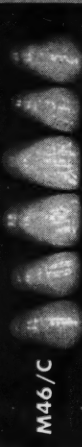
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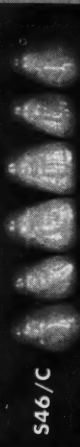
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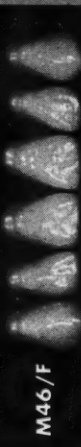
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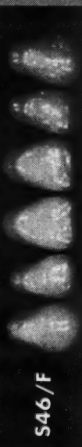
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# Dental Digest

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**FEBRUARY 1951***About Our***CONTRIBUTORS**

WILLIAM I. OGUS, D.D.S. (George Washington University, 1917) also did postgraduate work at Northwestern University. Doctor Ogus is consultant surgeon to the United States Air Force and to the Glendale and Gallinger Hospitals, District of Columbia. Doctor Ogus, who is well known to DICEST readers for his many articles on dental surgery and allied subjects, presents in the current issue RESEARCH REPORT ON IMPLANTATION OF METALS.

MANUEL M. ALBUM, D.D.S. (Temple University, School of Dentistry, 1943) who is consultant to the Philadelphia Society for Crippled Children and Adults presents in the current issue DENTAL TECHNIQUES AND TREATMENT IN CEREBRAL PALSY in which he describes in detail operative procedures and techniques in the dental treatment of cerebral palsied children.

THOMAS H. FORDE, D.D.S. of Washington, D.C., is a specialist in oral dynamics. In the present issue Doctor Forde presents the second installment of a four-part article, ORAL DYNAMICS, for which Doctor Edward Koltisko, also a practitioner in Washington, did the drawings.

HERMAN S. SUSMAN, B.S. (Omaha University, 1937), D.D.S. (Creighton University, College of Dentistry, 1943) last published in DICEST in August 1950. For his second presentation Doctor Susman publishes MENTAL DENTISTRY, a case history from his own practice.

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The magazine is mailed on the fifteenth of the month of issue.

## Research Report

### on IMPLANTATION of METALS

WILLIAM I. OGUS, D.D.S., Washington, D.C.

#### DIGEST

The following are among the many materials that have been used in the past in attempts to close tissue defects: Animal bone, celluloid, aluminum, gold, silver, platinum, autogenic and heterogenic bone grafts, cartilage, sliding grafts of cranium bone, decalcified bone, buttons of bone and chips of bone.

Most of the material produced a reaction as to a foreign body and sloughed out or had to be removed. This is particularly true of all the materials used except autogenic bone grafts. Because of this unsatisfactory reaction, all operations involving metal plates were discarded by 1930.

In the early thirties stainless steel and alloys of vitallium, titanium, and tantalum were introduced. The manufacturers of these metals enlisted surgeons

and oral surgeons to study the tissue tolerance of these metals and alloys. Their combined reports demonstrated that these particular metals and alloys were electrically neutral and could be used as implants.

This article presents a review of the use of implants and step-by-step directions for the application of a specific implant technique in dentistry.

Author's Note: The vitallium implants used in the cases described in this article were furnished by Austenal Laboratories, Inc.

1. Incision, first operation. Incision is made slightly to the buccal of the median line.

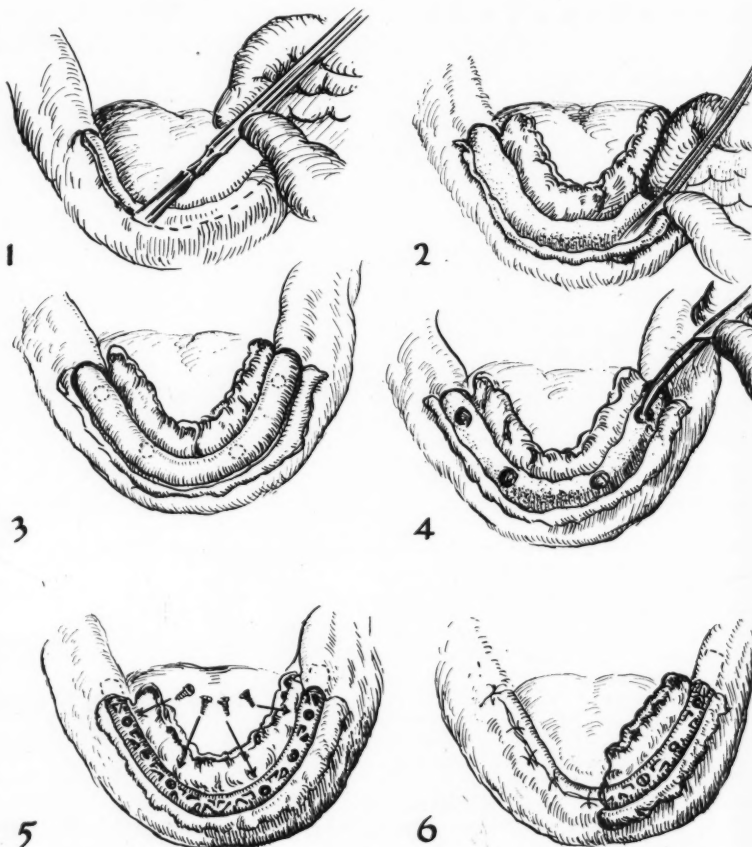
2. Retraction of tissue and exposing of alveolus.

3. Marking of ridge for grinding of slots.

4. Cutting of slots by the use of metal base which has been cut with holes in metal.

5. Insertion of implant at second operation. The threaded tubes are covered temporarily by threaded screws.

6. Completely covering implant for a period of two to three months.



#### Medical Reports

In 1938 Venable and Stuck<sup>1</sup> presented their original papers on the use of vitallium in bone-plating operations. Since that time they have published a number of papers on the use of vitallium in bone surgery. They demonstrated that corrosion of metal plates and screws is due to electrolysis occurring between the metals as well as alloys of metals and eventually came to the following conclusions: (1) There are two electrically neutral

<sup>1</sup>Venable, D.: Osteosynthesis in the Presence of Metal; Studies on Electrolysis, South. M. J. 31:501-508 (May) 1938.

metals which can be used in vivo. (2) One is silver, 96 per cent chemically pure, and the other is an alloy of cobalt, chromium, and molybdenum (vitallium). (3) Silver of this purity is not adaptable as far as rigidity and tensile strength are concerned.

#### *Absence of Corrosion and Atrophy*

—The transplantation of vitallium into the body over bone surfaces and into bone surfaces produces no reaction of the tissue, with the result that there is no corrosion and no atrophy of the surrounding tissue. Hopkins and Zuck<sup>2</sup> reported the first use of a vitallium cup in arthroplasty of the hip with the same satisfactory results as Venable and Stuck had with plates and screws.

*The Skull Implant*—Geib<sup>3</sup> reported experiments on vitallium skull plates in 1941. He found that vitallium would reduce the time of operation

and give more rigid restoration of the part involved. The implant was screwed into position with vitallium screws. The important problem that presented was that in skull implants the implant was placed under a superficial surface such as the scalp, where in all other bone-plating operations the plates were covered by muscle. After observing four cases it was demonstrated that vitallium is inert in the body and that it does not make any difference how superficial it is to the surface of the body as long as it is covered by tissue. This was an important development in dental implants which depend on superficial surface attachment by the periosteum.

*Pathologic Report*—An implant which had been in place for nine months was cut out with a half inch margin of bone without disturbing the implant. The condition of the plate was the same as at the time of

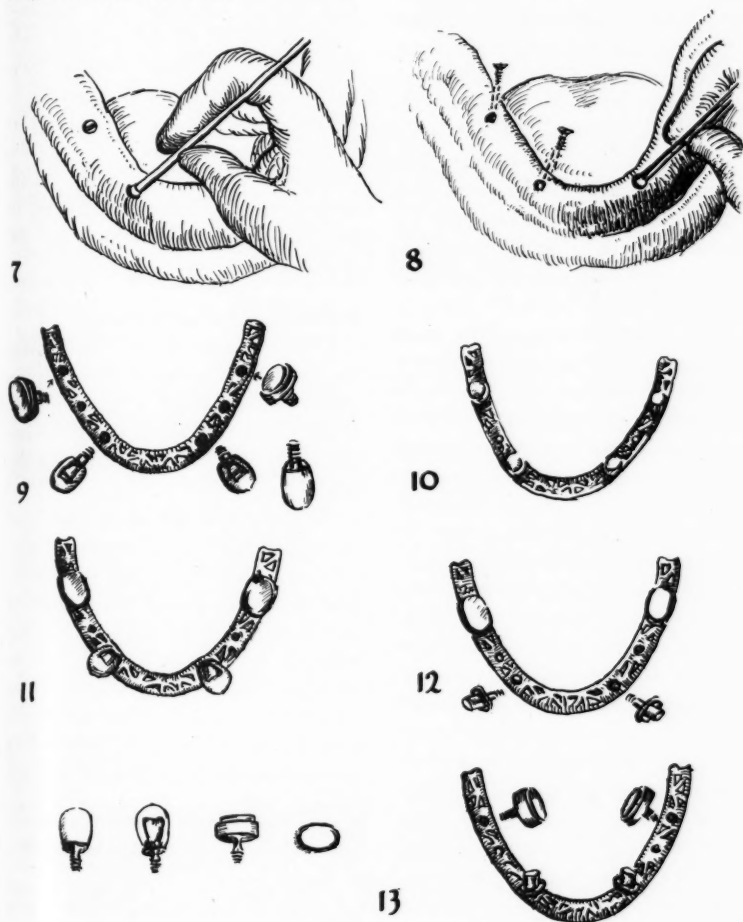
insertion: 1. The high luster was unchanged; screws were firmly embedded in the bone. 2. The soft tissue had grown about the plate up through the slots and small openings, and had completely incorporated in a fibrous covering. 3. The tissue over the plate was firmly attached and peeled off the plate much as a gelatine would peel off a glass surface. 4. The dura beneath the plate had regenerated itself where the operation had left a defect at the time of the original craniotomies. 5. No tissue reaction was evident and this autopsy proved the author's theory that the tissue would grow up through and around the openings and slots of the vitallium plates, obliterating all dead space and tending to hold the plate more securely in position as if it were part of the tissue.

#### *Implantation of Vitallium Screws*

—In 1941 Strock<sup>4</sup> reported his experience in implanting vitallium screws into healed sockets of anterior teeth. He placed a jacket crown after bone regeneration had taken place; tissue adhered to the neck of the preparation. His success led to further studies by others.

*Implantation of Cast Roots*—In 1942 the author reported his technique on implantation of cast roots with a protective collar below and a prepared jacket crown preparation. The root implant was held in position by a thimble placed over the jacket crown preparation with two wires

<sup>4</sup>Strock, M. S.: The Artificial Eruption of Malposed Teeth, *DENTAL DIGEST* 47:10-14 (Jan.) 1941.



**7.** Creating an implant. At the period of healing a specially made knife is employed to remove tissue through the periosteum exposing screws. (Punch).

**8.** Screws are removed.

**9.** Male attachments are placed into threaded tubes.

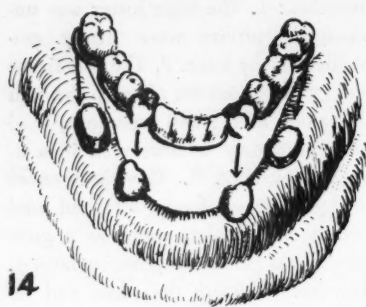
**10.** Appearance of cast base, inner surface.

**11.** Appliance with male attachments in position. Individual male implants. Note slot in lingual of cuspid male attachment.

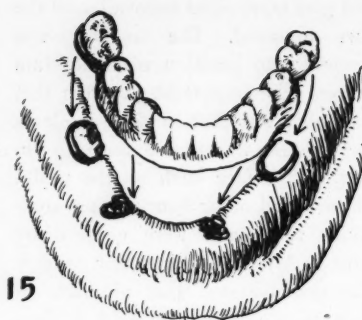
**12.** Jacket preparation male attachments for anterior rather than complete jacket crown as illustrated in Figure 11.

**13.** The slots can be used for either attachment after the case is completed.





14



15



14. Completed appliance with teeth resting on gingivae, in metal base.

15. Completed appliance with acrylic to build out facial features.



16

16. Showing the unprepared appearance of the alveolar ridge on the right and the prepared ridge on the left.

The cortical bone of the occlusal surface is removed. A flat ridge is prepared for the implant. The slots are then cut and the impression is made direct to the bone and including slots while the tissue is retracted. It is hoped that the regeneration of cortical bone will take place in the mesh of the implant.

projecting from the thimble to wire the adjacent teeth. After three months complete regeneration of the socket took place, the implant was firm, and the tissue under the protective collar appeared normal and firmly attached to the implant. When the jacket crown was placed, mastication pressure loosened the implant; when the jacket was removed, the implant became

firm. The technique was discontinued but the knowledge gained from this research was of aid in planning the procedure described, more particularly in (1) the protective collar used, and (2) the elimination of screws.

**Body of Mandible Replaced**—In 1945 Winter<sup>5</sup> published a case report of a vitallium implant replacing the body of a mandible. The mandible was previously removed due to adamantinoma. The space created by the removal of the mandible was preserved by packing between the periosteum until the implant was completed. The casting was made from impressions of the body of the removed mandible and x-rays.

The casting was inserted two weeks after surgery was performed. It was a complete implant, covered by the periosteum, and no effort was made to place a denture over this implant as the tissue was devitalized from exposure by x-ray used for treatment. This experiment laid the pattern for future implants of the jaws.

**Implant of Mandible, Hemisection**—In 1949 Castigliano and Gross<sup>6</sup> removed a mandible completely on one side and retained the ramus on the opposite right side. An implant was inserted, including a condyle replacement, on the left side and the

implant was fastened by screws to the ramus on the right side. The procedure was similar to that described by Winter, but was more extensive as it included the condyle on one side. The tissues were subjected to x-ray treatment and no attempt was made to place a superstructure above the implant. The implant is functioning after two years and has been a satisfactory replacement.

**Partial Subperiosteal Implant**—Weinberg<sup>7</sup> described his procedure in 1950 on partial subperiosteal implants which he has continued for three years, using no screws and depending on the strength of the mucoperiosteum and fill-in of the mesh.

**Partial Implants for Lower Dentures**—In the November 1949 issue of DENTAL DIGEST Goldberg and Gershkoff<sup>8</sup> reported on partial implants for lower dentures with male attachments coming through the tissue and a partial replacement in the frame of the implant. They were the first dental surgeons who reported the application of the implant technique in the literature and they have been successful in many cases as indicated by their most recent report in the November, 1950 issue of DENTAL DIGEST. Their reports stimulated further research and interest in the implantation technique by the dental profession.

### Technical Variations

1. **The Use of Screws**—Weinberg, who uses no screws in partial implants stresses the fact that the periosteum will hold the mesh of the implant and new tissue will form in the mesh.

Goldberg and Gershkoff state that the screws are not the important factor in holding the appliance and report that some screws have loosened and have had to be removed. In the author's experience, screws are an objection and their elimination is an added safety measure. In the appliance described herein, in which slots are cut into the bone and the impres-

<sup>5</sup>Winter, Leo: Embedment of Vitallium Mandibular Prosthesis as an Integral Part of the Operation for Removal of an Adamantinoma, *Am. J. Surg.* 69:318-324 (Sept.) 1945.

<sup>6</sup>Castigliano, S. G., and Gross, P. Philip: Immediate Replacement Following Radical Surgical Removal of the Mandible, in press.

<sup>7</sup>Weinberg, Bernair D.: Subperiosteal Implantation of a Vitallium Artificial Abutment, *J.A.D.A.* 40:549-550 (May) 1950.

<sup>8</sup>Ogus, William I.: The Vitallium Root Implant. Lecture Presented before the Northeastern Dental Society, June, 1942.

<sup>9</sup>Goldberg, Norman I., and Gershkoff, Aaron: The Lower Implant Denture *DENTAL DIGEST* 55:490-494 (Nov.) 1949.

17. Special impression tray made for individual ridge.

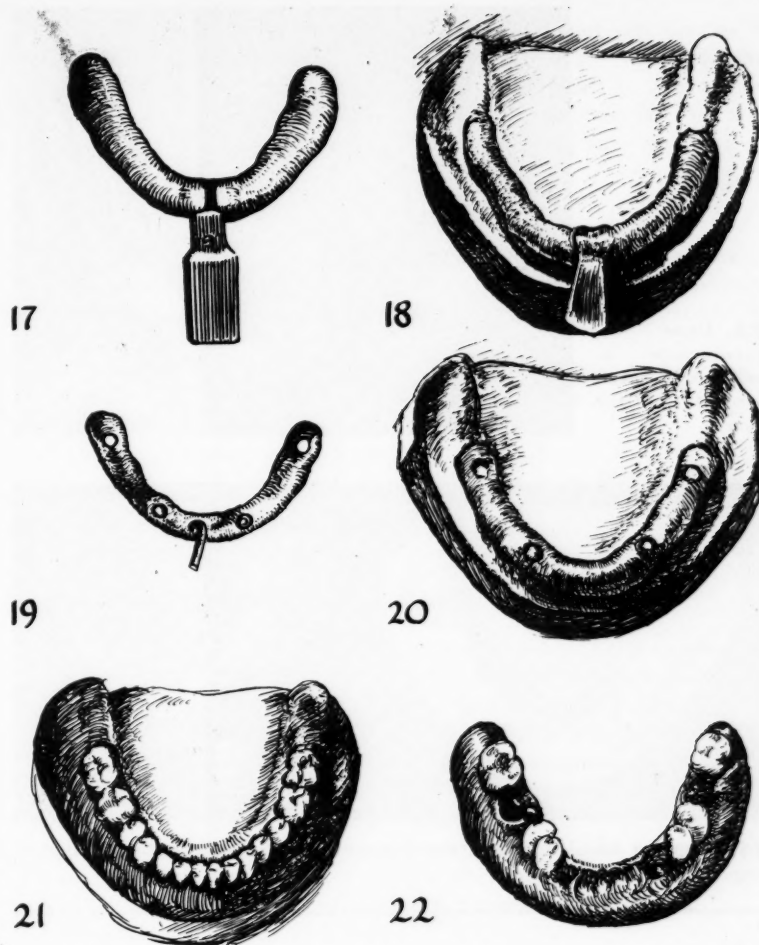
18. Tray in position.

19. Cast form used to aid in cutting slots and later used as a guide in locating temporary screw in threaded tube so that tissue can be removed above the screw.

20. Cast form placed on ridge on completely healed case to guide in locating the exact position of temporary screw.

21. Normal setup for an edentulous implant ridge.

22. Removal of cuspid and first molar teeth from setup. Piercing of holes to model; marking out of models through holes to indicate exact location of slots.



sions made direct to the bone after retracting the tissue, the casting with the slots will give sufficient leverage to eliminate screws.

2. *Accuracy of Measurement*—No hand nor machine can carve a model exactly to millimeter measurement. This method will create dead space. Dead space will fill in with tissue under the periosteum, but if the dead space can be eliminated it should be done. A direct impression of the bone with tissue retracted is a definite method for accuracy. It does involve another operation but the second operation is justified.

3. *The Possibility of Infection*—That infection about the male attachment may occur is not borne out by Goldberg and Gershkoff, Weinberg, nor the author, but it is a possibility.

To eliminate the possibility of infection, the author is now inserting a complete rather than a partial implant for a period of three months, returning to the earlier technique of Winter and Gross. When healing and regeneration are complete, cutting into the implant to remove the screws and immediately placing the male attachment into the threaded screw will minimize the possibility of future infection. With all the other healing completed, the newly exposed tissue is immediately covered by the collar of the male attachment.

### Lower Case Implant Technique

1. Impressions are taken of the upper and lower arches. Bite-blocks

are used, followed by setup of the teeth in the same manner as preparation for a full upper and lower denture.

2. The teeth in the spaces of the cuspid and first molars are removed and the center of this space is marked on the model through the socket of the tooth removed (Figs. 21 and 22). A vitallium cast is made of the ridge from the original model (Fig. 19). This cast is placed on the model when completed (Fig. 20). Teeth setup are placed over the cast and the markings are made on the cast through the cuspid-molar spaces. The holes are cut into the cast in the exact space where slots will be cut.

*First Operation*—1. The patient is anesthetized with a local or conductive anesthetic. An incision is made slightly buccal and labial to the center of the ridge (Figs. 1 and 2) and through the periosteum on the full

space to be covered by the future implant.

2. The periosteum is retracted labially, lingually, and buccally (Fig. 3). Sutures are placed through the labial and then through the lingual tissue and entwined in the ring of a hemostat for better retraction of the tissue by the assistant.

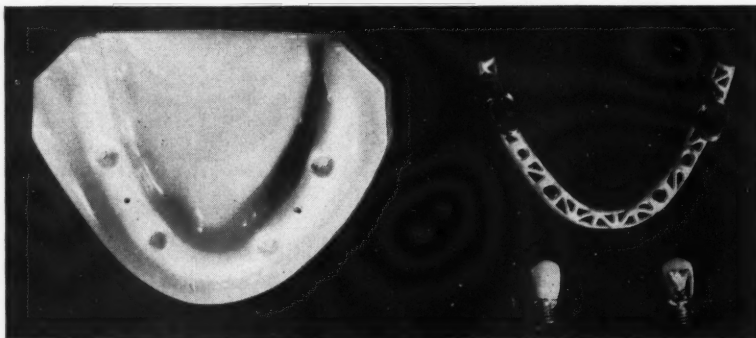
3. The cast is now placed on the ridge and slots are cut through holes of the cast (Fig. 4). The cast is removed and the slots are shaped to the desired shape and depth.

4. An impression is made with the material of choice direct to the bone and slots (Figs. 17 and 18).

5. The area is cleansed and sterilized and retracted tissue is brought into position and sutured.

6. When the implant has been completed, one to two weeks later, the patient is ready for the second operation, the insertion of the implant.

**23.** Upper superstructure in position to check for fit. (Mirror view).



**24.** Prepared model with slots. Partly assembled implant. Note lingual slots in cuspid.

**Second Operation**—1. The patient is hospitalized, prepared preoperatively, and premedicated. The anesthetic of choice is sodium pentothal, applied intravenously. A nasopharyn-

geal tube is inserted for breathing, attached to a nitrous oxide-oxygen machine. The throat is entirely closed and the mouth and ridge are completely sterilized.

**25.** Completed implant assembled.

**26.** Completed case in function. Clasps have been eliminated, precision attachments used.

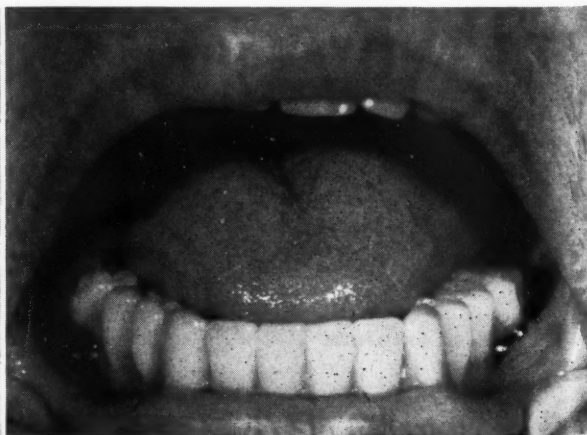
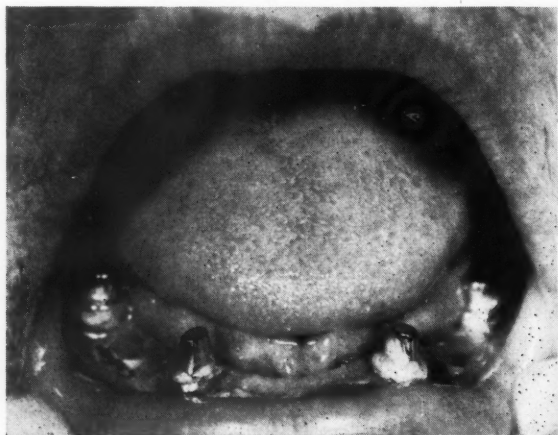
2. An incision is made, using previous incision. The periosteum is retracted. The implant is fitted into position with male attachments in place

(Fig. 5). The bite is checked. The male attachments are removed and temporary screws are inserted into the threaded tubes (Fig. 5). This is done to seal the tube to prevent seepage from under the flap during healing. The tissues are now brought together and sutured (Fig. 6).

3. After routine postoperative treatment at hospital and at office, the sutures are removed in five or six days and the tissue is allowed to heal. This implant is now left as a complete implant for a period of three to four months. When healing is complete, the case is ready for insertion of the male attachments and setting of the appliance of choice.

4. The tissue is anesthetized with a local anesthetic around the area of the two or four abutments to be used. The cast (Fig. 4) is placed on the ridge to determine the exact location of temporary screws. A special knife (punch) is used to remove the tissue covering the tube holding the temporary screw (Fig. 7). This is done with one stroke, removing tissue through the periosteum and exposing the head of the screw. The screw is removed and the male attachment is screwed into position (Fig. 9). The superstructure (Fig. 23) of the future appliance is placed in position; a new impression and new bite are established, and the case is completed and immediately inserted.

5. The author is constructing a lower case in which only two cuspid will be used rather than four abutments. The temporary screws in the





two posterior threaded tubes have been left in and the tissue allowed to heal. If it is found that two abutments are sufficient, the appliance will remain attached to two abutments. Should there be insufficient support to this appliance, it is planned to open into the posterior tubes, remove the temporary screws, and attach posterior abutments.

### **Technique for Upper Implants**

1. This technique is similar to the procedure used for the lower implant except that in the upper cases slots are used only in the two cuspid areas.

The implant is made the length to accommodate three bicuspid posterior to the cuspid abutments. Because of the maxillary sinus position it is inadvisable to use slots or screws in this area. It has been found that two cuspid abutments are sufficient for upper cases.

2. There are few cases that require upper implants. There are, however, patients who constantly gag so that it is impossible for them to wear full upper dentures.

### **Comment**

In planning implant cases there will be many in which there is not suf-

ficient space to cut slots because of alveolar resorption and atrophic changes. It is well to prepare the alveolus surgically as the first step. Labial or lingual slots may be combined with screws where necessary.

### **Conclusion**

This article is written as a research report. It is intended to add information to that already recorded. At times it will be necessary to incorporate all techniques in the completion of a single case.

1832 Eye Street, N.W.

## **Milk for Control of Vomiting Caused by Aureomycin**

BARTHOLOMEW and Nichols<sup>1</sup> state that although aureomycin is readily absorbed after oral administration, the effectiveness and ease of this method is often seriously impaired by the nausea and vomiting which may be produced by the aureomycin. Aluminum hydroxide gels, milk, and various alkalis have been administered simultaneously with the aureomycin in attempts to alleviate the

gastrointestinal irritation. Recent studies demonstrated that the absorption of aureomycin into the blood stream is impaired when aluminum hydroxide gels are administered simultaneously. The authors found the administration of 200 cubic centimeters (one glass) of milk simultaneously with the aureomycin most effective. Of a group of 50 patients receiving this combination, only four experienced significant nausea and vomiting. Studies using milk with the aureomycin were carried out in order

to ascertain whether the milk interfered with the absorption of aureomycin. The levels of aureomycin in the serum after the administration of 750 milligrams of aureomycin with 200 cubic centimeters of milk are approximately the same as the levels obtained when 750 milligrams of aureomycin is given alone to fasting patients.

From Current Medical Literature, *Journal of the American Medical Association* 144:495 (Oct. 7) 1950.

<sup>1</sup>Bartholomew, L. G., and Nichols, D. R.: Use of Milk to Control Vomiting Caused by Aureomycin, Proc. Staff Meet. Mayo Clinic 25:370 (June 21) 1950.

## **Danger of Poisoning From Mercury Vapor**

A SUGGESTED method of removing amalgam from a diamond "stone" by revolving the instrument in a bath of hot mercury was recently announced.<sup>1</sup> A picture of heating the mercury held over a bunsen flame with a diamond "stone" being re-

volved in the mercury accompanied the suggestion. The Council believes this is an exceedingly dangerous practice because of the poisonous mercury vapor being given off.

The industrial health hazard of breathing air contaminated with mercury vapor is well established. Den-

tists are therefore cautioned never to heat mercury in such a manner that the vapor will contaminate the air.

J. L. T. Appleton, Chairman, Council on Dental Research, American Dental Association.

<sup>1</sup>DENTAL DIGEST 56:533 (December) 1950.

### **The Cover**

THE NUMBERS in the cover design, reproduced through the courtesy of *The Cancer Bulletin*, refer to the sites of primary cancers in the inner anatomy of the head and neck, located as follows: 17. Cervical esophagus. 18. Vocal cord (intrinsic larynx). 19. Epiglottis (extrinsic larynx). 20. Tonsil. 21. Nasopharynx. 22. Sphenoid. 23. Ethmoid cells. 24. Nasal cavity. 25. Maxillary sinus. 26. Palate. 27. Buccal mucosa. 28. Tongue. 29. Floor of mouth. 30. Gingiva. 31. Lip.

# Dental Techniques and Treatment

## in CEREBRAL PALSY

MANUEL M. ALBUM, D.D.S., Philadelphia

### DIGEST

*The techniques necessary in the treatment of cerebral palsied children are not difficult if several fundamental rules are observed.*

*The environmental background of the child, the details of his physical condition, in addition to an assessment of his characteristic personality features are of major importance.*

*A plan of technique in these cases and operative procedures is outlined in detail in this article. A method for use in extractions and directions for the application of anesthetics is also given.*

### Basic Principles in Treatment

The cardinal principle underlying all forms of treatment is the degree of patience possessed by the dentist or the operator. Cerebral palsied children are extremely sensitive as a rule and are easily frightened and upset by unfamiliar surroundings and noises.

If the dentist is not kind, cheerful, and understanding in his approach, or if he does not have the patience necessary to undertake thorough treatment rather than slipshod measures, the uneasiness will be transmitted to the child and the operation will be difficult and taxing.

**Environmental Factors**—As described in a previous article by the author,<sup>1</sup> the child may be treated alone or may be seated on the lap of the parent who will aid the dentist. The noise of the dental engine will arouse sudden fear in many of these

children and for this reason should be allowed to run prior to its use in the oral cavity. This will decrease the amount of discomfort to the child.

**Brief Appointments Desirable**—The duration of each visit should be controlled so that it is not too tiring to the child. An appointment that is too long with these children may create a disturbance to the general daily routine. This will be evidenced by the following symptoms: (1) bruxism, (2) loss of appetite, (3) loss of sleep, and (4) a temporary setback in the child's progress.

**Parental Influence Important**—It is known that parental influence can produce a psychosomatic disturbance to the child making it almost impossible to perform dental treatment. When the presence of the parent is desirable during treatment can only be determined by the dentist and the reaction of the child.

### Cleaning and Prophylaxis of Teeth

**Salivary Calculus**—In patients with large deposits of salivary calculus and otherwise satisfactory periodontal condition, the technique is with a few exceptions the same as that used in treating normal children. The armamentarium consists of Universal and Jacquette scalers or those preferred by the operator: (1) rubber cups, (2) pumice, (3) a mouth mirror, and (4) several tongue depressors.

**Procedure**—1. Examine the oral cavity before proceeding to the actual prophylaxis. Using a mirror and a tongue depressor will make investigation possible without fear of injury to the dentist's fingers as a result

of the sudden closure of the patient's jaw. If the child closes on the tongue depressor, a little pressure exerted by the operator on the stick will open the jaws. Placing the thumb and forefinger of the free hand over and under the symphysis of the chin will also assist in releasing the tension of the mandible. The mirror should be used in such a way that in the event of closure of the jaws the patient does not close on the glass part of the mirror. Although it is possible to fracture the glass, the chances of doing so are slight if proper precautions are taken and should be of no alarm to the dentist.

2. Thorough scaling with Universal and Jacquette scalers should be the first step in the actual prophylaxis of the teeth. All deposits of calculus should be removed to prevent recurrence.

3. The surfaces of the teeth should be cleaned with pumice on a rubber cup. It is an excellent suggestion to mix a little disclosing solution with the pumice. Any debris that remains following the scaling will be loosened up by the disclosing solution.

4. If the patient is intelligent, he should be taught the proper use of the toothbrush, otherwise the parent must be instructed in its correct usage. In some children it will be advisable to use a toothpaste instead of powder. The decision will depend on the type of cerebral palsy that the child represents.

**Periodontoclasia**—In cases where the more severe condition of periodontoclasia is present, the same basic routine is followed as described for simple calculus removal. In addition, the following steps should be taken:

1. In periodontoclasia, the operator must be certain that all of the calculus is removed. Serumal calculus will be found well down along the

<sup>1</sup>Album, Manuel M.: Dentistry—An Asset to the Cerebral Palsied Child, DENTAL DIGEST 56:258-263 (June) 1951.



**1, 2, 3 and 4.** Various types of cerebral palsied patients. Patient in Figure 1 is also hydrocephalic.

roots of the lower incisor teeth.

2. There may be evidence of pus, severe gingival recession, and bone resorption around several teeth requiring extraction of these teeth following prophylaxis.

3. The bite should be checked for malocclusion, and if it is necessary to correct equilibration, it should be done.

### Operative Procedures

The routine for preparing and restoring cavities is similar to that of

normal children with several exceptions:

1. The cerebral palsied child should be examined with the aid of a mirror and tongue depressor, in addition to the explorer. The tongue depressor should always be within easy reach of the operator. It may be held in the free hand of the den-

tist or it may be used by the dental assistant to retract the cheek, and utilized when necessary as a safety measure.

The suggestions previously outlined concerning unfamiliar noises made by the dental engine should be taken into consideration.

2. The dentist should use as light a touch as possible when operating.

3. Caustics, such as phenol, should not be used on cerebral palsied children, as accidental sloughing of the tissues may occur when the child per-



forms any jerky motions. The use of metaphen untinted is advocated to sterilize the cavity.

4. Cotton rolls used to isolate the cavity should be of a size that will not cause discomfort to the patient. Many cerebral palsied patients are mouth breathers and a cotton roll that is too large will produce gagging.

5. If the cavity is of the size necessary to accommodate a cement base it should be inserted. This is good practice as there is apt to be less reaction on the part of the pulp.

6. Amalgam, silicates, or copper cement should be inserted over the cement base. Basic carving should be carried out and the patient dismissed.

7. All deep pits and fissures should be treated with silver nitrate or if necessary restored.

8. Teeth which show arrested development and poor nutritional disturbances should be watched carefully, and if the dentist believes it is of importance to the dental health and general health of the child to prepare the teeth and restore them, he should not hesitate to do so.

9. Where it is necessary to make restorations under a general anesthetic, nitrous oxide-oxygen or pentothal sodium followed by nitrous oxide-oxygen is used. In performing operative procedure under general anesthesia it is a good policy not to continue for longer than half an hour.

### **Technique for Extractions and the Use of Anesthesia**

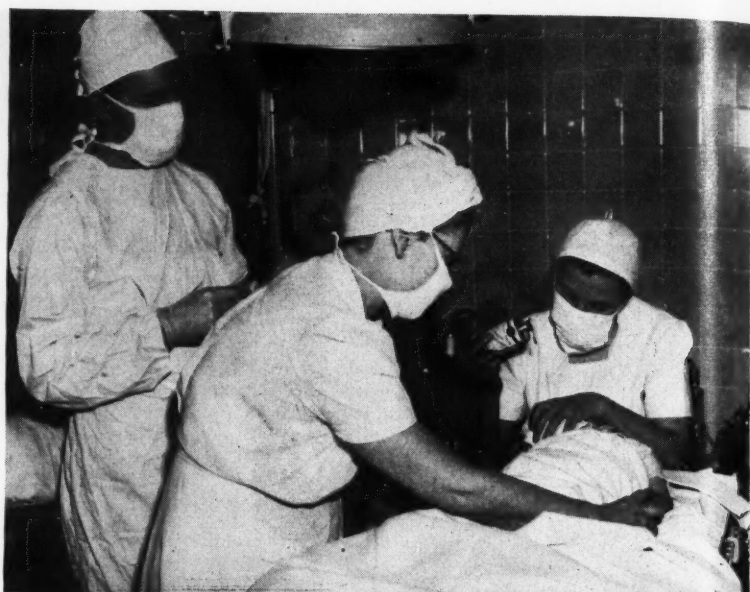
1. The author's previous article presents a complete technique for the use of anesthesia in the cerebral palsied child.

2. Before exodontia or anesthesia is contemplated, the patient's physical condition is ascertained. Any suspicious circumstance in the case history should be investigated before performing extractions or oral surgery.

3. Clotting time, bleeding time, and urinalysis should be done prior to extractions.

4. Patients requiring several extractions should be hospitalized a day before the operation.

5. Patients who are hospitalized may have preoperative medication



**5 and 6.** *The administration of open drop ether anesthesia and the subsequent extraction of the teeth.*

such as 1/300 grain atropine sulfate to check the flow of saliva, and 1/8 grain morphine sulfate for sedation. It may be necessary to use a vitamin K substance such as synkavite to hasten abnormal clotting. This is usually given in a dose of 10 milligrams intramuscularly preoperatively.

6. The dentist should not hesitate to use oxycel, gelfoam, or hemopak

in the socket to ensure proper clotting. Sutures may also be necessary.

7. The patient should not be dismissed until the blood clot has formed satisfactorily and there are no foreign particles remaining in the socket.

8. Another 10 milligrams of synkavite may be given two hours after the operation.

9. Routine measures to check the hemorrhaging of the socket, should this occur, should be carried out.

10. Duration of the operation should, if possible, not exceed thirty minutes.

### **Comments on Anesthesia**

General anesthetics are chemical substances which act directly on the brain, inhibiting its function. The centers of respiration and circulation are unaffected. Local anesthetics act on the sensory nerve endings in a circumscribed area. The central nervous system is not depressed.

For anesthesia to be satisfactory, it must be painless, thorough, and devoid of danger. This is of utmost importance when treating cerebral palsied children.

*Nitrous Oxide-Oxygen the Recommended Agent*—There is no perfect anesthetic method or agent although nitrous oxide is the mildest and least toxic of the common general anes-

thetics. The anoxic state may be produced more rapidly with nitrous oxide-oxygen than with any other anesthetic, as restriction of the oxygen intake will enhance the normally weak action of the nitrous oxide.

*Safe Oxygen Level Must be Maintained*—In many anesthetic agents the margin of safety is too narrow and the passage from the light stage to the deep stage is too rapid. A safe oxygen level must be maintained at all times during nitrous oxide administration to prevent liver damage and acidosis. Extremely young children are often difficult to control under nitrous oxide-oxygen because their blood volume is relatively small and their nervous systems are unstable or immature.

*Ether Anesthesia Used in Clinic*—Surgery in cerebral palsied children at the clinic sponsored by the Philadelphia Society for Crippled Children and Adults is performed under ether anesthesia. After-effects are few and

recovery is faster than with other agents. If the patient undergoes complications under ether anesthesia, the anesthetic agent is removed and air and oxygen are administered until it is possible to continue with the anesthetic.

*Local Anesthesia May be Used*—When using a local anesthetic, the dentist should be familiar with the pharmacologic and physiologic effects of the anesthetic solution. Local anesthesia may be safely used on athetoid patients. However, a firm grasp of the cheek and the syringe must be maintained at all times to prevent injury from movements of the patient.

It is well to remember that an anesthetic agent is only safe in relation to the skill of the administrator. Anesthetics can become deadly weapons when administered improperly.

1930 Chestnut Street.

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## **Dental Meeting Dates**

Thomas P. Hinman Midwinter Clinic, Municipal Auditorium, Atlanta, Georgia, March 25-28.

Arkansas State Dental Association, regular meeting, LaFayette Hotel, Little Rock, April 1-4.

Oklahoma State Dental Association, regular meeting, Oklahoma City, April 15-18.

Alabama State Dental Association,

regular meeting, Birmingham, April 16-18.

California State Dental Association, regular meeting, San Francisco, April 16-18.

American Association of Industrial Dentists, a component member of the Industrial Health Conference, annual meeting, Atlantic City, New Jersey, 24-26.

Maryland State Dental Association, regular meeting, Baltimore, May 7-9.

Nebraska State Dental Association, regular meeting, Lincoln, May 14-16.

North Dakota State Dental Association, regular meeting, Grand Forks, May 17-20.

New Mexico State Dental Association, regular meeting, Santa Fe, May 21-23.

## ORAL DYNAMICS (Part Two)

THOMAS H. FORDE, D.D.S., Washington, D.C.

### DIGEST

*Oral forces can operate in a single direction or in a multiple pattern. Accordingly, the possible situations that can confront the dentist may assume astromonic numbers. Diagnosis, therefore, must be formulated carefully by means of the fundamental laws, physical, chemical, and biologic upon which oral dynamics are based.*

*A major factor in the premature loss of teeth, approached from the angle of oral dynamics, is the application of the conventional three-dimensional plan of balance after the arches have reached their final development. The dynamics underlying this point of view are discussed in detail in this article which is the second in a series of four.*

### Two-Dimensional Plan of Balance vs. Three-Dimensional Plan of Balance

Two different plans of balance, (1) two-dimensional plan, and (2) three-dimensional plan must be translated in terms of force. We cannot speak of a physical two-dimensional plan and expect anyone to visualize it. However, force can operate in a single direction or in a multiple pattern. Therefore, the two-dimensional plan of balance can be simply described as the removal of one of the dimensional forces that is found in the civilized mouth and not found to any great extent in the primitive mouth.

*A Major Factor in the Premature Loss of Teeth*—It is the author's con-

viction that the conventional three-dimensional plan of balance is wrong if allowed to continue after the arches have reached their final development, and that this plan (known as bilateral balance) is one of the major factors contributing to the premature loss of the teeth.

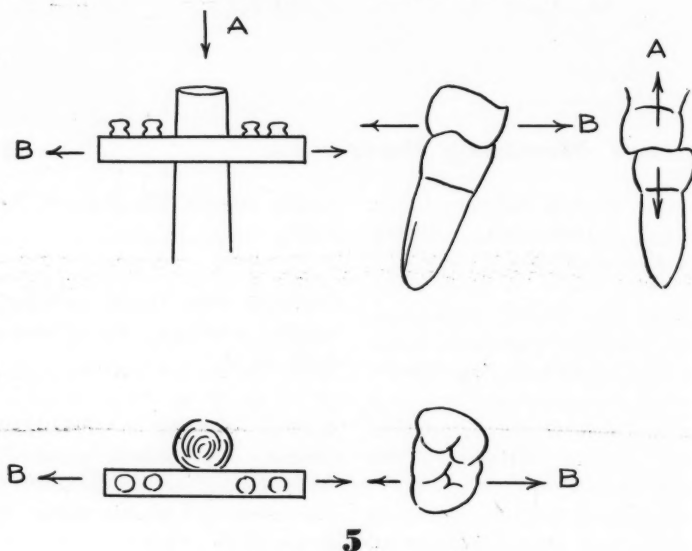
*Diagram 5*—In order to describe further the force pattern that operates in the different plans of balance it is necessary to refer to the fundamental law of the lever. Diagram 5 shows views of a post and a tooth:

1. The lower part of the diagram shows the occlusal surface of the tooth and the top of a telephone pole.
2. The upper part of the diagram shows the lateral view of the same objects.
3. The arrows indicate thrusts that activate the fundamental law of the lever.

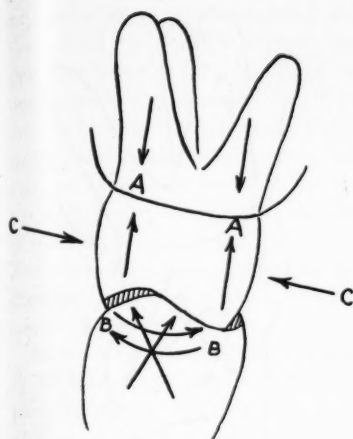
4. The force represented by arrow A in the upper diagram, by striking directly on top of the pole, nullifies the law and is the only force that could strike the pole without engaging the full value of the working arm of the pole.

*Conclusion*—In the three-dimensional plan of balance it is recognized that as long as we have cuspal interdigitation we must contend with buccolingual thrusts, with an excessive thrust buccally inclined on all the upper posterior teeth.

*Naturally Bite-corrected Teeth*—The third figure in Diagram 5 indicates naturally bite-corrected teeth where the thrusts are virtually vertical on impact or transfer to a morsel of food. Note (1) that this plan of force corresponds to arrow A on the top of the pole, and (2) that arrow B is absent in this plan. There is no concern for the arrow on the lingual surface because it is protected by contact with other teeth.







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**The Element of Fatigue**—In the interdigitating, locking arrangement of the posterior teeth the element of fatigue necessarily runs high. The same element of fatigue would run low in the third drawing because the strains are absorbed parallel to the roots. The impact is received in the direction in which the roots can absorb the strains without being exposed to the destructive forces exerted under bilateral balance.

**Theory of Bilateral Balance Rejected**—Bilateral balance apparently was conceived by studying an empty mouth and by misconstruing the way in which the jaws operate. There is truth in the old saying: "Enter food, exit bilateral balance."

**Unilateral Balance in Dentistry**—In dentistry unilateral balance must be respected whether it be in (1) natural teeth, (2) bridge construction, (3) partial dentures, or (4) full dentures. Unilateral balance operates through the morsel of food as well as it does in the empty mouth. No attempt is made to enforce any part of the theory of bilateral balance. This is not a modification or a weak gesture to palliate the basis of dental education. It is, rather, an outright rejection for a plan of balance that is responsible for the loss of millions of teeth.

### The Two-Dimensional Plan of Balance

The two-dimensional force plan of balance is best described by the removal of buccal thrusts on the upper posterior tooth and lingual thrusts on the lower. This, of course, pertains to the natural teeth. The physical plan of this balance goes through every phase of dentistry, but starts with the natural teeth because it is the basis upon which bite correction stands.

**Diagram 6**—An upper posterior tooth is described. The arrows indicate the force pattern to which this tooth is subjected:

1. The first arrow (A) shows that the tooth can resist both a push and a pull.

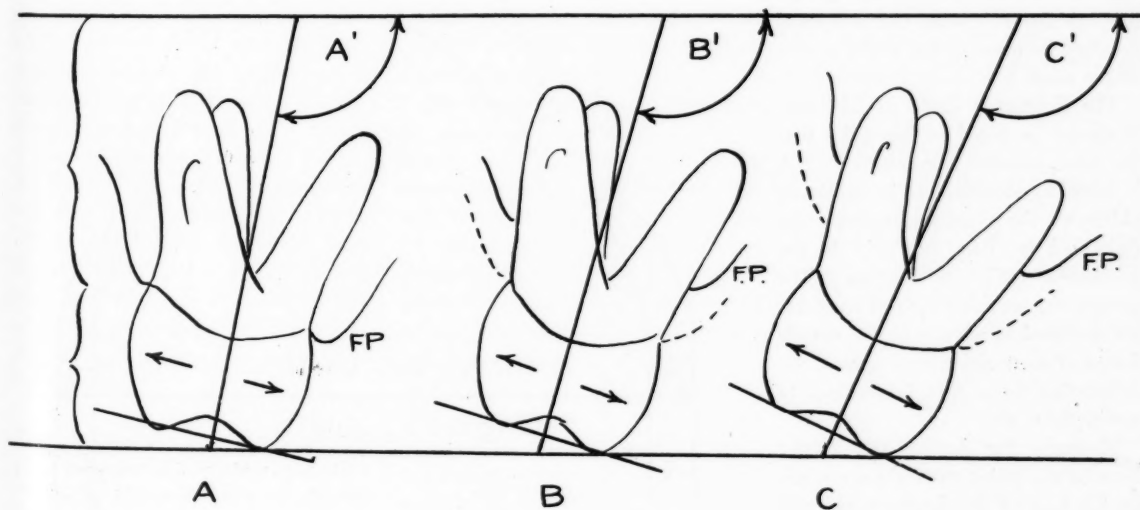
2. The circular arrows (B) show that it can resist rotation in either direction.

3. The remaining two arrows (C) are the arrows of primary consideration in this discussion. We can now concentrate on arrow C alone because it is activated by the powerful muscles and is controlled by the fundamental law of the lever. This force is removed by grinding the buccal cusp of the upper tooth and the lingual cusp of the lower tooth.

**The Basis for Bite Correction**—In the drawing showing the occlusion of the upper and lower teeth the cusps that have been removed are indicated by shading. This establishes a stereotyped plan that should not be ignored until this subject is more completely explored. The plan, however, does set up the basis upon which bite correction is carried out.

**Possible Dental Situations**—To show the importance of careful diagnosis, the probable number of combinations should be considered. These combinations may include (1) a missing tooth, (2) teeth out of line, (3) other situations, and are represented by factorial 32 which is described by the expression,  $25,313 \times 10^{31}$ .

**The Formulation of Diagnosis**—The factorial  $25,313 \times 10^{31}$  is arrived at by multiplying  $32 \times 31 \times 30 \times 29$ , down to 1, the result being an astro-



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nomie figure running into the trillions which looks like the measurement of light years between the earth and some remote planet.

**Application of Fundamental Laws**—Actually, the astronomic figure obtained represents the number of different problems a dentist can face in his lifetime. In view of this figure it is evident that stereotyped rules cannot serve as the basis for diagnosis. Diagnosis must be formulated through the application of the fundamental laws, physical, chemical, and biologic, upon which oral dynamics is based.

### Inclination

**Diagram 7**—The change in the inclination of an upper molar with the corresponding loss of bone as the fulcrum point advances toward the roots of the teeth:

1. The first part (A) shows the molar in a relatively favorable position on the ridge which would represent extremely early adult life. It should be noted that Angle A' is slightly oblique but it marks the inclination of the roots. At this state the fulcrum point, marked FP, shows the process encompassing the tooth at its proper position at the cervical line.

2. Part B, Diagram 7, shows an increase in the angle marked B'. In this drawing (1) the angle from the horizontal position is becoming more oblique, (2) the fulcrum point has advanced from the cervical line to the line marked FP, with (3) a corresponding increase in the working arm of the tooth.

**The Geometric Ratio of Increase:** It should be noted at this point that the same pressure applied in Part A is virtually doubled in its straining ability on the same supporting roots described in Part B. This is the geometric ratio of increase. The greater the working arm, the greater the mechanical advantage the muscle forces of mastication have against the supporting bone that is striving to retain the tooth.

**Measures for Saving the Tooth:** Even at this point, the right approach on the part of the dentist could still save the tooth. It could never be accomplished through spot grinding or

any form of equilibration. The tooth can be saved only by recognizing the fundamental law of the lever and nullifying its action through grinding.

3. The drawing in Diagram 7 marked C shows the oblique angle (C') extended almost to its limit. At this point (1) the compensating bone on the buccal aspect of the tooth is virtually gone, (2) the fulcrum point is advanced to a short distance from the apex of the root, and (3) the tooth is in the same precarious state as a telephone pole whose foundation is washed away by erosion. Almost the full power of the law of the lever is enforced: (1) The working arm here is beyond reason, (2) the supporting bone is gone, and (3) the tooth is ready for exfoliation.

**The Value of Medication**—To illustrate the value of medication, the writer would like to draw a comparison between an engineer and a dentist: If the engineer stood by and watched the elements wash away the supporting foundation of the telephone pole and did nothing until it reached a serious state, and then attempted to palliate it with medications, he would be no more ridiculous than the dentist who watches these processes disappear and persists in treating the violation of the fundamental law of the lever with medication. The unfortunate part of this

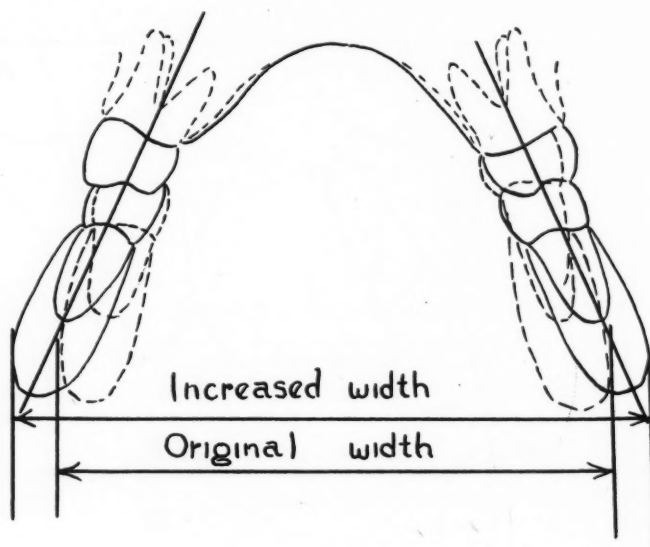


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comparison is that the engineer would lose his job, while the dentist is not only paid for his useless medication but is also compensated for removing the tooth.

### Maxillary and Mandibular Deformities

Diagram 8 shows approximately the normal relationship existing in the early adult mouth at fifteen years of age. At this period the function of



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expansion should be completed and the normal relationship between upper and lower teeth should be as nearly perfect as possible. It will be noted (1) that the full three-dimensional plan of balance is in effect, and (2) the expanding forces in the upper arch are operating with the corresponding forces on the lower arch. The prevailing arrows indicate the direction in which the blow of the masticator is absorbed.

**Masticating Forces, Primitive Man vs. Contemporary Man**—1. It is emphasized that if this were the mouth of a primitive man the conspicuous cusps on the corresponding teeth would already be modified and the strong functional forces of expansion and condensation would be reduced.

2. In the mouths of civilized people these forces are stronger in early adult life than at any previous period. All masticating muscles are fully developed with the resulting power factor in force.

**Diagram 9**—A somewhat later stage in adult life is shown with an expanding upper arch and a corresponding widening of the mandible. There are two conditions resulting in the lower jaw: (1) the mandible can widen and bend in the entire body, and (2) the tooth can be driven down toward the floor of the mouth, biologically, with or without bending the body of the mandible.

**Variations Noted in the Position of Lower Posterior Teeth**—The diagrams and concepts presented in this article are concepts derived from years of research and experience in this field. The fact remains that (1) the lower posterior teeth are frequently found depressed downward toward the floor of the mouth with a marked crowding of all anterior teeth, while (2) in other cases the lower teeth maintain their vertical and axial positions and follow a widening of the mandible in order to correspond to their functional position against the upper teeth.

### **The Progressive Change of the Lower Anterior Teeth**

(1) At fourteen years of age the lower anterior teeth can appear perfectly aligned, (2) they may become

crowded before twenty years of age, or (3) they can change between twenty and thirty. The age is not the principal consideration but the change of the bite is the primary cause of this loss of position and alignment. This is brought about by the closing bite.

**Factors which Produce Crowding of the Lower Anterior Teeth**—In this discussion the concern is with the normal arch in which all teeth are in correct position. Under such conditions the following factors produce crowding of the lower anterior teeth:

(1) The upper arch expands and the lower arch condenses; there is a loss in the vertical dimension which brings the lower cuspid in contact with the lingual planes of the upper cuspid, tending to deflect the lower cuspid inward toward the median line. The opposite condition seldom appears, for the upper cuspid, being the stronger of the two and better invested in bone, is not easily forced out of alignment. The weaker tooth must suffer the deflection and move toward the median line from the continuous force which is driving it lingually as the jaws close.

(2) The lower anterior teeth respond to the condensing action of the cuspids as they gradually overlap to conform to the reduced arc. The lower anterior teeth now strike the lingual surfaces of the upper anterior and either move the upper anteriors forward or recede themselves to a more lingual position. This increases the crowded condition with resultant trauma and bone loss.

(3) The labial osseous plate on the upper cuspid becomes extremely thin or retrenches as a result of the outward pounding and traumatic effect. The loss of bone is conspicuous by the resulting retrenchment of gingival tissue. Erosion or cervical caries ensue. The upper anterior teeth suffer from the traumatic effect and will move forward or loosen as a result of bone loss. In rare instances, they may compensate with a heavy deposit of bone over the labial plate.

**The Inevitable Termination**—The underlying tragedy of this slowly changing deformity is the eventual loss of either the lower teeth, the up-

per teeth, or both from trauma. The condition is progressive and will terminate with the inevitable loss of the teeth unless the dentist can recognize that the source of the trouble is in the posterior region of the mouth.

(1) An expanding upper arch, (2) an overcondensing lower arch, or (3) both these conditions, cause the loss which can be averted only by bite correction.

### **Progressive Deformities**

Many combinations of deformities exist between the upper and lower arches. The progressive deformity begins after both arches are perfectly formed and completely aligned according to the best dental conception. This can be marked as the first deformity and initial tragedy because it occurs in the mouths of all people who have been informed that they have perfect dentition; that they need little or no dental care.

**Contributing Factors in Dental Deformity**—In the "perfect" dentition referred to, the following are some of the factors present: (1) There is no evidence of wear, and a complete interlocking action upon closing of the jaws is characterized by long overlapping buccal cusps, descending deep into the embrasures of the lower teeth or on their respective buccal surfaces; (2) The lower anteriors are found in close proximity with the lingual surfaces of the upper anteriors, and the lingual surfaces of the upper cuspids are found overlapping the respective labial surfaces of the lower cuspids; (3) The lingual cusps of the lower molars, and frequently the bicuspid, are found high and pinnacle-like in anatomic character.

These particulars, as previously described, are the contributing factors in the *depression* of the lower posterior teeth and the *expansion* of the upper posterior teeth.

**The Inception of the Dental Tragedy**—The foregoing picture, representing the essence of dental perfection from the dentist's standpoint, must now be recognized as the beginning of the dental tragedy and must be named as a number one deformity.

**Effects of Excessive Masticating Efficiency**: Many Negroes in early adult



life present a full complement of teeth, including the third molars, aligned to perfection as previously described, without cavities, and without gingival disorder.

These same people, a few years later, show the devastating effects of a masticating efficiency that is greater than the supporting structures can bear. The presence of all varieties of gingival bone destruction becomes evident, and the teeth are exfoliated

without evidence of dental caries.

**Special Stones Required:** Bite correction on Negroes is an extremely difficult operation. The dentist will discover that grinding these hardened enamel surfaces requires special stones with quick wearing, hard abrasive quality.

**Hard Teeth Fail to Wear**—Periodontal difficulties are more likely to accompany *hard teeth, which show a remarkable resistance to dental caries,*

than those that are soft, demineralized, and highly susceptible to caries. The latter are frequently reduced by caries or by some of the many dental operations. However, if these operations restore the conventional anatomy, the periodontal structure will break down exactly as it does in mouths with hardened teeth that show no signs of wear or abrasion.

(To be Continued)

5510 16th Street, N.W.

## Dentistry and the Atomic Energy Program

WILLIAM WARD WAINWRIGHT, D.D.S.

### Future Development

The possibility of using radioactive substances *directly* in the dental office awaits development.

There are, however, immediate possibilities for their *indirect* application. Modern dental practice is built upon the information the microscope has provided. In the same way radioisotopes open new possibilities for improving methods of office practice.

### Immediate Applications

1. To determine the adequacy of circulation. When an extremity is to be amputated a Geiger counter will trace the radiosodium to the exact point where amputation is safe. In a particular case it might mean the difference between amputation above or below the knee, a factor of extreme importance to the patient.

2. In repairing an extensive injury. With the aid of radioisotopes (1) the adequacy of collateral circulation could be accurately determined, or (2) the progress of repair of circulation during healing could be followed.

3. In experimental surgery. The small amount of a short-lived radioisotope employed is known as a tracer dose.

**Substitute for Radium**—(1) Because its gamma radiations are essentially the same as those from radium, (2) because it is easily produced in the uranium pile, and (3) because it is free of the alpha radiation component found in radium and radon and is not stored indefinitely

in bone as is radium, radio-cobalt is beginning to be used as a substitute for radium in radiation therapy.

**Treatment of Tumors**—The greatest contribution of the atomic energy program to clinical therapy is the production of radioiodine for the treatment of metastatic tumors of the thyroid gland.

In some cases it is found that the metastatic lesions in distant parts of the body, as well as the thyroid tissue in the gland, are able to take up and concentrate large amounts of radioiodine. As the unstable radioiodine disintegrates, it releases energy in the form of gamma and beta rays which tend to destroy the malignant lesions.

### Expected Improvements in Dental Materials

Some of the available radioisotopes listed in the Radioisotope Catalogue (1947) of the United States Atomic Energy Commission are the following: mercury, gold, silver, zinc, copper, nickel, cadmium, chromium, iridium, palladium, tantalum, molybdenum, calcium, and phosphorus; fluorine, beryllium, arsenic, manganese, vanadium, lead, and iron.

These elements are constituents in a great number of dental materials in daily use: plastics, cements, amalgams, bands, casting golds, instruments, local and general anesthetics, sedatives, foods, and medication.

### Isotopes of Value in Investigating

1. The problem of the disappearance of mercury or silver in a rough

eroded amalgam restoration can be answered by an investigator tracing radioactive mercury or silver from restorations placed in animals.

2. Why do silicate cements dissolve rapidly in the mouth of one person and apparently not at all in another? Radioisotopes have been incorporated in cements and silicates by Zander<sup>1</sup> of Tufts College Dental School in testing the efficiency of cavity liners in prepared cavities in animals.

3. The same method might be used for a rapid test tube determination of the solubility of silicate cements in the saliva of a patient who does not retain silicates well.

### Understanding of Physiologic Processes Aided

That the permeability of dentin to radiophosphate depends on the morphologic and pathologic state of the dentin and is altered by treatment with medicaments such as phenol and silver nitrate has been shown: 1. Instead of sealing the floor of the cavity, the permeability of dentin to radiophosphate was *increased* by medication.

2. Radiofluorine has been used to measure the ability of enamel to take up fluoride. This technique can be applied to numerous problems in the search for improved methods of dental caries prevention.

3. The penetrating power of different fluorine salts could be tested; the ability of dental enamel of per-

(Continued on page 92)

# MENTAL DENTISTRY

H. S. SUSMAN, B.S., D.D.S., Omaha

## DIGEST

*The two problems encountered by the dental student early in his clinical training are: 1) Where do you draw the line between theory and practicability in your dental practice? 2) How far do you go in making concessions in your diagnosis and treatment to your patients?*

*The dental student learns that every now and then there is a patient who does not agree with the best outlined plan of procedure devised by himself and his instructors. The patient, however, availing himself of the dental school's services from circumstances and not from choice, usually accepts the outlined treatment.*

*After graduation the practitioner soon learns that there is often resistance to a diagnosis or*

*ideal treatment. The patient wishes to assist the dentist in making decisions as to the quality and quantity of treatment intended for his specific needs.*

*The seasoned clinician realizes that there are times when he must make concessions. Experience teaches him that such action builds good will and aids the patient to make the proper mental and physical adjustment during a changing oral condition.*

*This case history is that of a middle-aged professional man who for personal reasons had resolved to keep his remaining loose pyorrhetic teeth although dentures were indicated. His contention was that he was at a point in his career where he was unwilling to wear any kind of artificial teeth. He was determined to keep his own teeth.*

## Case History

Five and a half years ago the patient, Mr. Z, presented himself for dental treatment. He had lost his upper left central incisor in an automobile accident.

*Past History*—1. The patient stated that until this time he had received only emergency restorations and extractions with an occasional prophylaxis.

2. Every dentist that he had visited had told him to have his teeth extracted and replaced with dentures.

3. He brushed his teeth only when he went to some social function.

*The Patient's Dental Theory*—The patient's theory concerning infection was that nature would eventually take care of it. As long as he felt well, he believed in leaving well enough alone.

## The Patient's Requirements Fulfilled

All that Mr. Z wanted now was the replacement of the upper left central incisor so that he would look presentable. A cantilever type bridge, a pontic attached to a three-quarter crown on the upper right central, was placed (Fig. 1, study model 1).

## Treatment Proposed

The following systematic program of treatment and of replacement was strongly urged: 1. An upper removable bridge. 2. A lower bar case and removal of the lower right elongated and diseased lateral and first molar (Fig. 1, study models 1 and 1A).

The lower teeth to be extracted were each marked with an X. Note the malocclusion in Figure 2. The patient rejected the suggested treatment.

## Progress

1. For the next three years Mr. Z's visits were sporadic. There was no oral improvement. Optimum progress was retarded by his indifference to home care and dental treatment.

2. The same instructions (1) of the necessity of using dental floss, (2) brushing the teeth after meals, and (3) returning for regular treatment were repeated at each visit. He was told that his contributory negligence was hastening the necessity of the dentures that he dreaded.

3. By the end of the three-year period, Mr. Z decided to have only an upper removable bridge made because he noticed that his teeth were becoming protruded as had been predicted. Again a lower removable bridge was suggested to help hold his lower teeth in position but he rejected the idea.

*Lack of Patient Cooperation*—1. An upper removable bridge was constructed which he wore off and on for only six months because of his habit of rebelling against wearing artificial teeth. He was seen only once during the six months.

2. For the following year and a half Mr. Z did not wear the upper removable bridge nor did he appear for treatment.

3. Labial and buccal protrusion increased in the already loose pyorrhetic upper teeth which resulted in the partial denture not being able to go to position.

**1. Occlusal views of plaster models of upper and lower jaws at first presentation of patient five and one-half years ago, showing pyorrhetic condition. (1) Upper jaw with restored anterior cantilever bridge. (1A) Lower jaw with outlined suggested splint and two teeth (right lateral and first molar) marked X for extraction.**

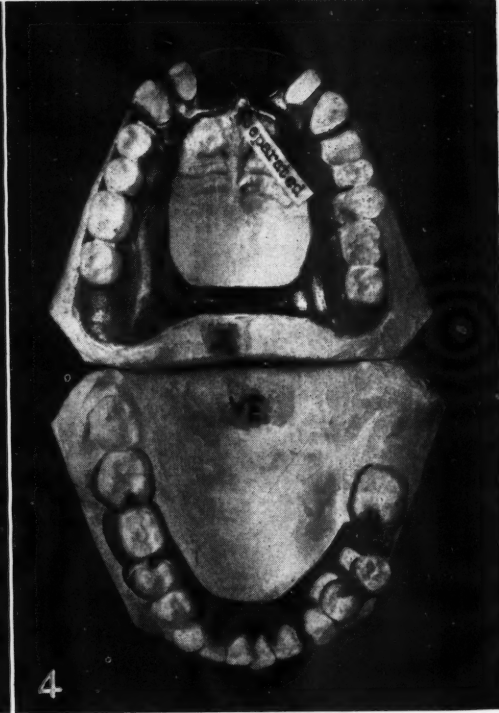


**2. Right side view of models 1 and 1A in malocclusion. Note large buccal cavity in lower right first molar.**

**3. Occlusal views of plaster models of patient's jaws three years after first visit, showing further loss of pyorrhetic teeth.**



**4. Restored upper and lower jaws with removable pyorrhetic splints (as originally suggested) a few weeks later. (3) Upper jaw splint separated along midline of both centrals to facilitate removal and replacement over extremely protruding teeth. (3A) Lower apron bar type splint.**



**Acute Symptoms**—Mr. Z took an automotive vacation during which he had several oral flare-ups and suffered the following acute symptoms: 1. The face and submaxillary glands became swollen at various times.

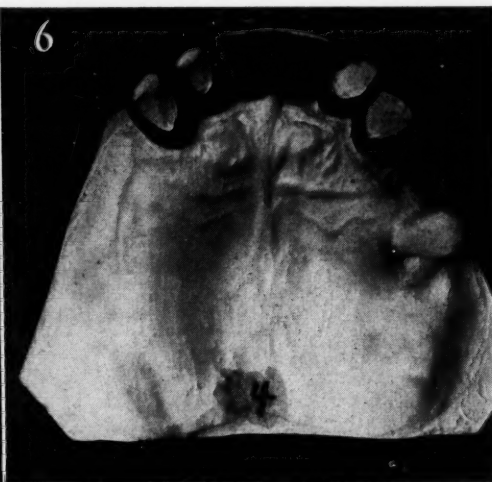
2. He had to be hospitalized and treated by a dentist and a physician.

When Mr. Z arrived home and began to feel better he was willing to have "only the bad teeth" removed.

**Extractions**—The following in-

fectured teeth were extracted: (1) the upper right second molar, (2) the upper right central, with its accompanying cantilever left central, (3) the upper left first bicuspid, (4) the lower right lateral and lower





5. Right side view of models 3 and 3A showing a corrected occlusion and esthetics.

6. (4) Occlusal view of upper jaw with removable anterior bridge for esthetic wear only.

right first molar (Figs. 1 and 3).

### Figure 2

Note the deep gingivo-buccal cavity in the bifurcation of the lower right first molar in Figure 2. As the molar was extremely pyorrhetic, it was decided merely to relieve the sensitivity and mark time until its extraction.

**Treatment**—Most of the caries, without pulpal exposure, was removed from the buccal cavity and the area was treated with Howe's ammoniacal silver nitrate solution four times within a five-year period.

**Result of Treatment**—Although mouth cleanliness was at a low level nearly up to the time when the tooth was extracted, the treatments set down a hard immunizing barrier of silver proteinate one-half millimeter thick. The cavity had gradually become desensitized and the caries did not penetrate the pulp.

### Comment

1. The success of the described treatment in a gingivo-buccal cavity in extremely poor condition suggests the possibilities for treatment of similar cavities under optimum conditions in the presence of 1) good isolation, 2) thorough drying, 3) medicinal penetration for four minutes, 4) regular treatments, and 5) good mouth hygiene. Cavities could be treated and left open for years provided they were properly contoured (A) to exclude food, and (B) not to irritate the gingivae.

2. Howe's solution was not in-

tended as a substitute for a proper restoration; for example, the author restored in another patient's mouth six deep buccal cavities that had been given periodic treatment with the solution for over fifteen years. The patient, a dentist, had left the cavities open and under treatment for that length of time to demonstrate that teeth could be saved with correct preventive dentistry.

### Patient Assumes Responsibility

When healing was complete (Fig. 3, study models 2 and 2A) Mr. Z's oral condition had improved but he was still insistent that he would not have dentures although he was advised that removable bridges would be impermanent because of his remaining loose teeth. The patient stated that he was willing to assume all of the responsibility for his decision.

### Problem of Fitting a Partial Bridge

It was found that the extreme flaring out in different directions of the five remaining teeth (Fig. 3, study model 2) made it difficult for a continuous one-piece partial denture to fit, regardless of the clasp design. Even if it were possible to force an upper partial denture into place, it would not stay because the protrusive angles of the teeth were too great to allow for enough resilience of the clasps to hold the partial against the palate.

**Solution**—The removable bridge was split in the midline slightly mesial to the centrals and the posterior palatal bar was used as a spring to expand the whole structure laterally in both directions. By doing this the clasps would slip over the protrusive tooth surfaces and go to place.

**Pressure Relieved**—During its placement and removal this type of structural arrangement relieved the unnecessary pressures on all the upper teeth. There was a great deal more stability to this broken stress splint than was originally expected (Fig. 4). Compare the occlusion and the appearance of Figure 2 with the finished case in Figure 5.

### Follow-up Treatment

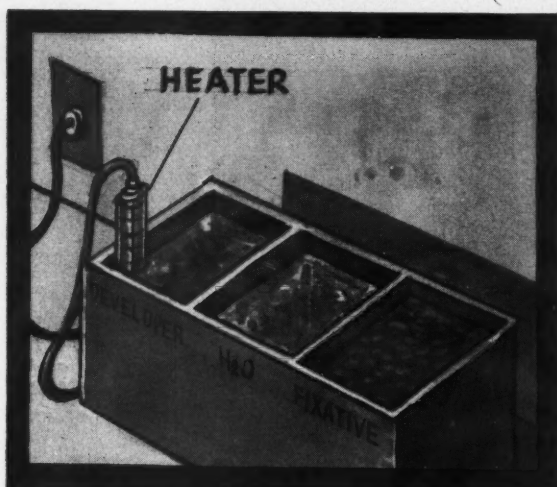
1. The bridge has been worn faithfully for six months. Although the alveolae and periodontium appear healthier than they had been and the remaining teeth have become firmer in their sockets, no promises were made as to their permanence.

2. The patient now brushes his teeth regularly after each meal.

3. Dental floss is used between the contact points and primus prophylactic cord between the wider proximals.

4. Because of unusually heavy deposits of calculus the patient makes monthly visits for treatment. According to his family physician, his general health and physical condition are satisfactory.

930 Medical Arts Building.



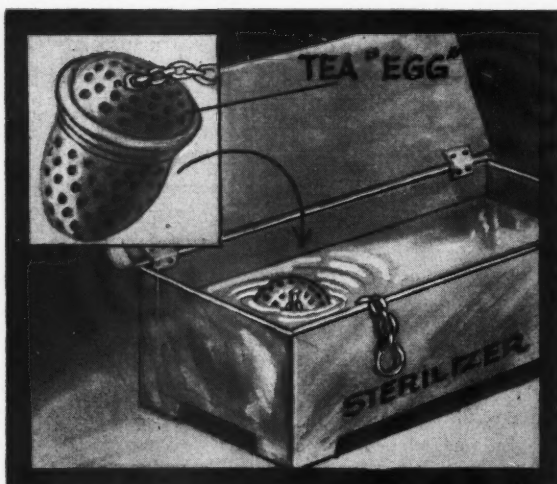
1

## Clinical and Laboratory

### Maintenance of Proper Developer Temperature

Solomon S. Seidenberg, D.D.S., Brooklyn, N.Y.

1. A small electric water heater, such as one used in a tropical fish bowl, when regulated to 65° Fahrenheit and used in the developer compartment will maintain proper temperature for accurate film processing.

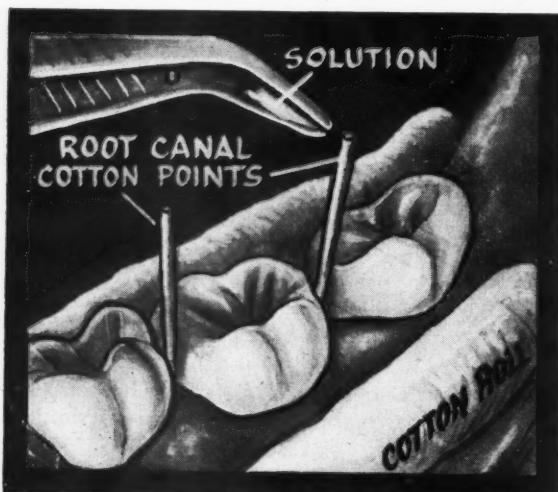


2

### Sterilizing Small Buoyant Objects

Herbert Rinkoff, D.D.S., Bronx, N.Y.

2. Rubber polishing cups, plastic wedges, and similar small buoyant objects often float in the water of the sterilizer and are difficult to find or pick up. Put them into a large "tea egg," a device used for holding tea leaves.



3

### Applying Medicaments to the Interproximal Tissues

Albert A. Sunshine, D.D.S., Brooklyn, N.Y.

3. The area is isolated with cotton rolls and dried. Root canal points are placed in the interproximal space or pocket. The medicament is carried to the mouth in closed cotton pliers and it is desposited on the absorbent point. The cotton point acts as a wick to carry the solution to position and retain it in the area under treatment.

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## SUGGESTIONS . . .

### Preventing Evaporation of Volatile Liquids

Daniel T. Horowitz, D.D.S., Bronx, N.Y.

4. To prevent the rapid evaporation of a solution such as chloroform from a preparation of chloropercha one may stretch a piece of rubber dam material over the mouth of the bottle containing the volatile liquid. Replace the screw cap, release the taut rubber dam material. When the cap has been screwed down an airtight seal has been secured.

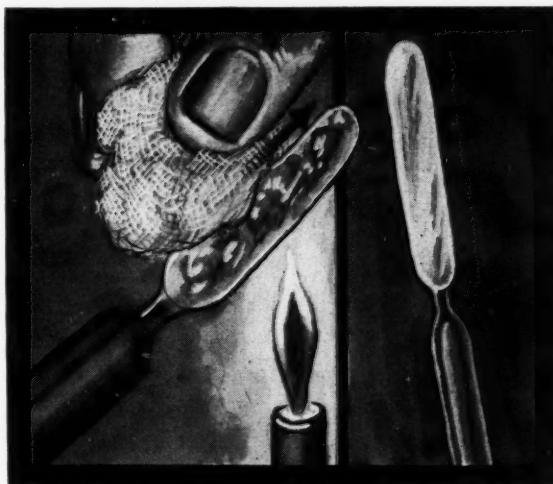


4

### Removing Zinc Oxide-Eugenol Paste From a Spatula

M. Kottler, D.D.S., Newark, N.J.

5. After mixing zinc oxide-eugenol paste for impressions it is difficult to remove hardened paste from the spatula. If the spatula is held over a flame the paste will soften and can be removed with a piece of cloth.

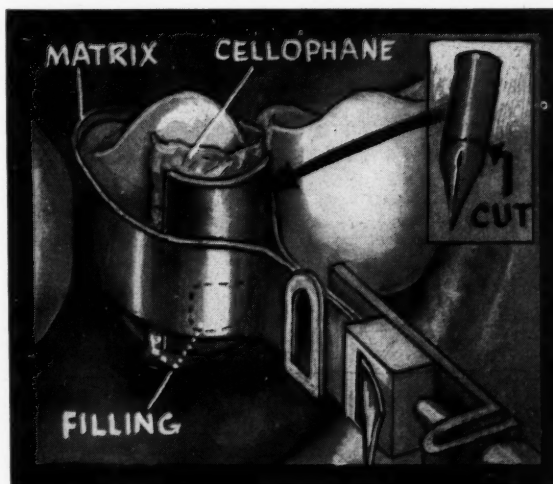


5

### A Gingival Matrix

Victor De Frank, D.D.S., New Castle, Ind.

6. After the gingival cavity is packed with acrylic, cover it with a piece of moist cellophane. A section of a pen point is placed over the cellophane and a regular matrix retainer is used to secure pressure while the acrylic is hardening.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 86 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



## The EDITOR'S Page

KAZANJIAN is a name admired wherever oral surgeons meet. We would expect that a book that he prepared would be preeminent. That it is! *The Surgical Treatment of Facial Injuries*<sup>1</sup> is one of those occasional titles that merits the label "masterpiece." Kazanjian and his co-author, Converse, out of a combined practice experience of fifty-three years have created a book that is rich in practical presentations and entirely devoid of unsubstantiated theory. The book is intended for plastic surgeons but the general surgeon and the dental surgeon will profit greatly from the reading.

Some writers on the subject of facial injuries have tried to relegate the dentist on the maxillofacial team to a mere technician's role. One who is called, not in consultation, but as a mechanic to fabricate an appliance on order. That kind of relationship never brought satisfactory treatment to a patient. Kazanjian states his position on this subject in forthright terms: "No text dealing with reconstructive surgery of the maxillofacial area is complete without due consideration to the role of the jaws and the dentition. We have attempted to, integrate and evaluate the prosthetic and facial aspects of facial reconstruction and to define their relative importance in a chapter on maxillofacial prosthesis." Kazanjian, with both medical and dental training, is prompt to emphasize the role of the dentist in maxillofacial rehabilitation.

Kazanjian's book appears fortuitously at a time when at least 10,000 dentists in the United States are faced with military service and the entire dental population is threatened with the possibilities of doing first aid work in atomic attack. Military dentists will be required to treat jaw fractures, and some facial injuries. In the event of an atomic attack civilian dentists will be compelled to know more than they now do about the principles of fa-

cial surgery, jaw fractures, burns, shock, and anesthetic management. No better source for this information is available than the Kazanjian-Converse text.

The fundamental anatomic and physiologic factors that govern the treatment of all fractures of the facial bones are:

"1. Since the facial bones form the framework and support of the soft tissues of the face, slight displacement of any of these bones affects the facial contour; such changes are noticeable following multiple fractures unless treatment is adequate.

"2. Fractures of the maxilla and mandible almost always disturb the occlusion, restrict mandibular movement, and interfere with proper masticatory function.

"3. Fractures of the nasal, zygomatic and maxillary bones may involve the paranasal sinuses, nasal fossae and the nasolacrimal apparatus. Consequently, injuries to these bones often result in a disturbance of nasal breathing and a predisposition to infection in the sinuses.

"4. A large part of the orbital cavity is formed by the zygomatic and maxillary bones, hence injuries to these bones may alter the position of the eyeball and cause visual disturbances.

"5. The bones of the upper part of the face are intimately associated with the bones of the skull; infection may lead to cranial complications. In severe fractures of the maxilla, fracture of the base of the skull must always be ruled out by careful examination."

With this clear enunciation of principles Kazanjian and Converse proceed to describe in clear text of 559 pages using 746 illustrations exactly *how* specific facial injuries are managed. It is a clinician's book for clinicians!

<sup>1</sup>Kazanjian, Varaztad Hovhannes, and Converse, John Marquis: *The Surgical Treatment of Facial Injuries*, Baltimore, The Williams & Wilkins Company, 1949, p. 85.

## Oral Cancer

*Lesions Often Escape Detection*—Most Americans follow the daily morning inspection of their mouths with a vigorous scrubbing, washing, and gargling.

It is, therefore, surprising that any lesion as obvious as a mouth cancer could escape detection. But many of them do with the result that several thousand Americans die every year from this disease which comprises 4 per cent of all cancer and 70 per cent of all cancer of the upper respiratory and digestive tracts.

*Consequences of Neglect are Perilous*—When the average person stumbles onto a buccal lesion he debates its significance for several days, weeks, or months. At first it causes little or no pain so for a time he forgets it. Eventually he becomes alarmed and goes either to a dentist or a physician. The chances are, educated in the importance of seeing a dentist twice a year, that the frightened person will go to the dentist first.

### The Dentist's Responsibility in Cancer Detection

If the dentist is suspicious of (A) chronic ulcers and abscesses, (B) any nonhealing sores and unusual swellings, and if he regards all of these abnormal features as malignant until they are proved otherwise, he may save a man's life.

*Local Therapy Often Recommended*—Unfortunately, in many cases in which the dentist is consulted first, cancer is not recognized. Study of a series of 157 patients who had seen a dentist first revealed that 62 per cent of the cancers went unrecognized. The dentists extracted teeth, prescribed mouth washes or applied other types of local therapy.

*Delay may be Disastrous*—The patient, reassured by the dentist's measures, often embarks upon a second program of delay that consumes several more precious months and which may prove disastrous.

### Diagnosis Relatively Easy

The physician and the dentist are

able to use direct methods of detection, (1) clinical inspection, and (2) digital examination. Indirect means, such as roentgenography, are necessary for the diagnosis of cancers in the more inaccessible areas of the body.

*Oral Examination*—All that is needed for an oral examination are the following:

1. Proper illumination
2. A finger cot or rubber gloves
3. A tongue depressor
4. Knowledge of what to look for

The only area not accessible to direct vision is the base of the tongue, and even this can be palpated.

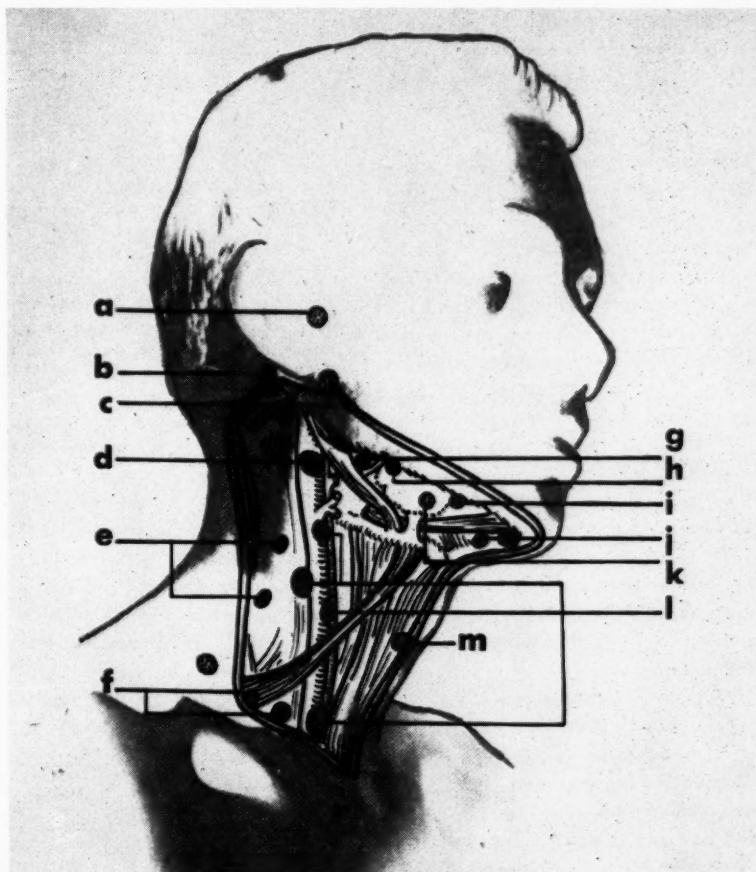
*Pain Not an Early Symptom*—The fact that, unlike most diseases, pain is not felt until secondary infection

of an ulcerated growth has occurred, explains much of the patient's indifference.

*Progressive Symptoms*—As the growth progresses the following conditions may be present:

1. Speech and swallowing may cause pain.
2. The patient may not be able to swallow his saliva and may be compelled to spit it out.
3. Dysphagia and dyspnea may result from encroachment on the larynx and pharynx.

It is usually after one of these signs that the patient decides something is wrong and presents himself for examination. By this time, the disease is often advanced. Diagnosis is easier, treatment is more difficult or useless.



1. Lymph nodes most frequently involved by metastases: a, preauricular; b, mastoid; c, parotid; d, subdigastic; e, spinal accessory chain; f, transverse cervical chain; g, retrovascular; h, prevascular; i, preglandular; j, submental; k, intraglandular; l, middle and lower nodes of deep or jugular chain; m, prelaryngeal. The nodes indicated by stippling cannot be seen at the level of the section.

Adapted from *The Cancer Bulletin* 1:99-118 (November-December) 1949.

## The Clinical Picture

1. The most common clinical picture presented by cancer is a coarsely granular ulcer with indurated, raised, rolled edges. However, early cancer may appear only as the following: (1) a fissured area of leukoplakia, (2) a tiny ulceration, (3) a papillary tumor, or (4) a necrotic ulcer.

2. On initial examination the physician or the dentist should palpate the entire mouth area, especially the tongue, and note any departure from normal.

### Chronicity of the Lesion Significant

—Cancer must be ruled out before the physician proceeds with treatment on the assumption that the lesion is benign:

(A) If the patient states that the lesion has existed and progressively increased in size over a period of several weeks or months the chances are that the lesion is neoplastic.

(B) If the patient states that the lesion has existed only a few days, the physician should not rule out cancer on that basis; many patients pay little attention to mouth ulcers until pain is noted.

### Resemblance to Benign Lesions—1.

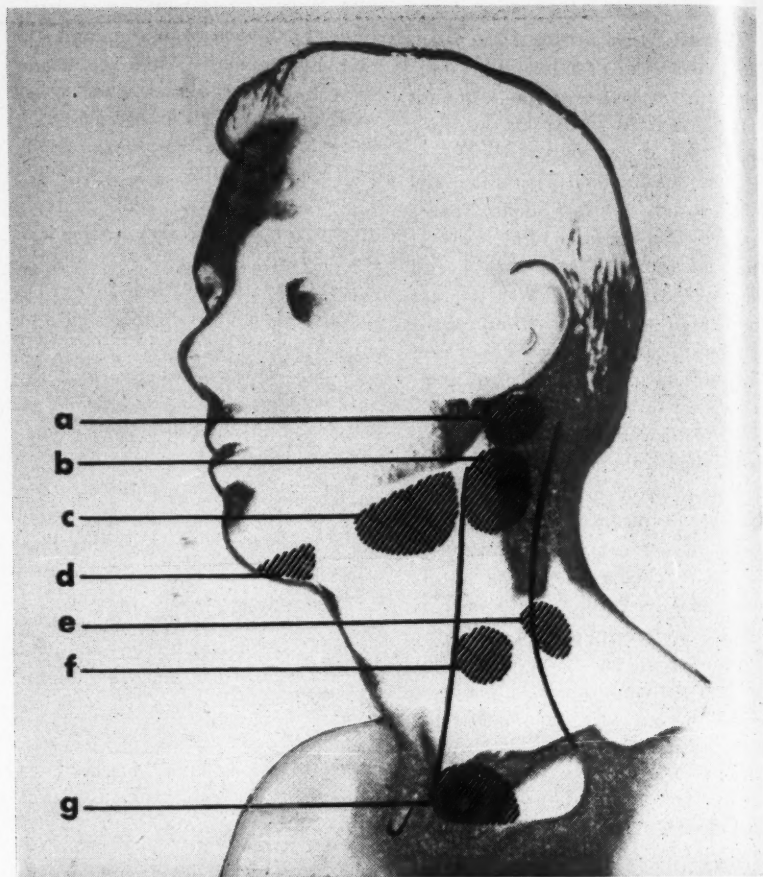
Cancer resembles several benign lesions of the mouth: Vincent's stomatitis, herpes, syphilitic gumma, and traumatic lesions caused by biting. Most of these conditions respond to proper treatment within two weeks. If by that time, therefore, the lesion still exists, biopsy and further studies should be carried out.

2. Lesions suspected of being syphilitic in origin should be biopsied even in the presence of a positive Wassermann, as one-third of all patients with tongue cancer have coincidental syphilis.

3. When a roentgenograph of a "dental abscess" shows bone destruction, the diagnosis is often cancer.

4. Simple radiculodental cysts are benign when unilocular, but are apt to be adamantinoma if multilocular.

**"Silent" Symptoms**—Cancer of the tonsil, base of the tongue, and palate



**2. Most frequent sites of metastases to neck nodes. When nodes in these areas are involved, the primary lesion usually is located in:** a, nasopharynx; b, any portion of the oral cavity, pharynx, larynx, and especially the nasopharynx, tonsil, and the base of the tongue; c, anterior two-thirds of the tongue, floor of the mouth, gums, and the mucosa of the cheek; d, lip; e, nasopharynx; f, same as b, with less frequency in early stages; g, thyroid, pyriform sinus, upper esophagus, and rarely sites below the clavicle.

are often initially asymptomatic, that is, they are "silent." The first indication of malignant disease is sometimes the presence of cervical node metastases. When a patient is found to have involved nodes, a careful search of the mouth and pharyngeal area should be made in order to locate the primary growth.

## Summary

1. If mouth cancer is discovered early it is relatively easy to treat and the chances of cure are good. Because

it is not usually discovered early, the survival rate is low.

2. One series of 145 patients had a cure rate of only 16 per cent. Seventy per cent of the patients in this series presented some form of lymph node involvement; they were diagnosed too late.

3. Until the dentist physician, and patient develop a high index of suspicion regarding any slow-healing lesion and any unusual swelling, cancerous lesions will always be diagnosed too late.





## Insurance Aspects of Heart Disease

The long commitment involved in life insurance is the essence of the difference between clinical medicine and life insurance medicine. The practicing physician is primarily concerned with the present state of his patient's health. In life insurance the concern is chiefly with the future, specifically the life expectancy of the person. Although there are many types of contracts to cover particular contingencies, it is not possible to issue life insurance unless a further life expectancy can be anticipated of at least fifteen years from the date of issue of the policy.

Insurance companies insist on a rigorous attitude in regard to various minor impairments. Obesity, albuminuria, slight glycosuria, elevation of the blood pressure or heart murmurs may not in themselves call for treatment or restriction of the patient's activities. However, statistical experience has shown that these conditions may be attended by a significant shortening of life expectancy, particularly when several impairments occur together. In life insurance each impairment must be considered from a statistical viewpoint.

Clinical diagnosis allows for procrastination at times but in insurance medicine an immediate decision is imperative. There is an increasing effort on the part of most insurance companies to consider each person as a whole.

It has been demonstrated conclusively that levels of blood pressure above 140 systolic and over 100 diastolic are definitely abnormal at any age. The actual mortality rate exceeds the expected mortality rate in rapidly rising ratios for systolic or diastolic values above these levels. Different companies vary somewhat in their practices regarding insurance applicants who have hypertension depending on the degree to which they underwrite substandard lives.

Blood pressure alone is insufficient in determining insurability. More im-

# M E D I C I N E

## and the Biologic Sciences



portant than the level of the blood pressure and its fluctuations, perhaps, is an estimate of the duration of the hypertension and the organic damage it has produced.

The mortality from heart failure and particularly the degenerative vascular changes resulting from longstanding hypertension occur without any necessary relation to the degree of hypertension. Of particular interest here is the rather benign course of hypertension in females as compared to males.

The general policy among American insurance companies is to reject all applicants with diastolic murmurs. A more liberal attitude is assumed in regard to the apical systolic murmur. There are some types of substandard policies for these applicants in many cases.

Other conditions receiving attention are (1) arrhythmia, (2) heart size, (3) coronary arteriosclerosis, and (4) chest pains. Most companies have discontinued the disability clause which pertains to waiver of premium in the event of disabling illness. Since disability in coronary disease depends so much on subjective symptoms rather than objective

findings it is not possible to appraise it properly. Many persons who have had one or more attacks of coronary occlusion carry on normally. Others are disabled with only a minor disturbance of the heart.

The problems of heart disease in insurance medicine are many and varied. Constant scrutiny and evaluation of data are necessary as a result of the many environmental problems arising from day to day.

*Ungerleider, Harry E., and Gubner, Richard: Insurance Aspects of Heart Disease, M. Clin. North America 34:805-816 (May) 1950.*



## Liver Function in Heart Failure

An interesting observation has been reported recently suggesting that there is an intimate relationship between chronic venous congestion of the liver and cardiac failure.

In a large number of cases of congestive cardiac failure the liver has been found to be enlarged. If the enlargement occurs rapidly the organ becomes tender owing to the sudden stretching of the capsule. Many of these patients complain of pain in the right part of the hypochondrium.

Latent jaundice is invariably present in patients with congestive cardiac failure. Clinical jaundice is often seen but it may be masked by the cyanosis. The presence of clinical jaundice in patients with congestive cardiac failure usually indicates a bad prognosis.

Ascites is common in congestive failure. Urobilinogen is present in excess in the urine of patients with cardiac failure. It diminishes when the failure is treated.

Many of these patients complain of a poor appetite often finding it impossible to eat large meals several weeks before the onset of their heart failure. These symptoms are presumably caused by chronic engorgement of the stomach resulting from venous stasis in the congested liver. Flatulence is another common feature in these patients.

When liver function tests indicate

a decidedly positive result the prognosis for the cardiac condition is not good. Cardiac cirrhosis or hepatic fibrosis of heart disease cannot be diagnosed with certainty.

*Branwood, A. W.: Observations on Liver Function in Heart Failure, Edinburgh M. J. 57:129-135 (March) 1950.*



### **Importance of Potassium**

In the past few years the importance of maintaining proper fluid and electrolyte balances for any living organism has been recognized. About 70 per cent of the body weight is water.

It has generally been believed that the body water is divided into two main compartments. About 20 per cent of the body weight is considered to be extracellular fluid which may be further separated into the intravascular plasma and the extravascular protein-free interstitial fluid.

The primary cations in the extracellular compartment are (1) sodium, (2) potassium, (3) calcium, and (4) magnesium. The anions are primarily (1) chloride, (2) bicarbonate, (3) small amounts of phosphates, (4) sulfates, (5) proteins, and (6) organic acids.

The other major fluid compartment of the human body is contained within the body cells. This makes up about 50 per cent of the body weight. This great mass of the body is controlled by the cations magnesium and especially potassium. The anions, bicarbonate, organic phosphates, sulfates and proteins also are important in the control process.

It is now recognized that rigid segregation of these ions by an impermeable cell membrane does not exist. Under certain conditions intracellular electrolytes must traverse the cell membrane and the same is true of some of the extracellular ions.

Potassium concentrations will vary with various conditions. Often striking clinical manifestations are noted. This is to be expected since potas-

sium is the primary cation controlling such a major part of the body mass. Also potassium is intimately related to the proper functioning of each individual cell.

Almost all of the potassium intake is excreted in the urine and feces. The human body is not capable of retaining potassium even in the presence of a marked negative potassium balance. Therefore it can be asserted that whenever there is no potassium intake a potassium deficit is present.

There is considerable evidence to indicate that the administrations of sodium salts will accelerate a potassium deficit. This fact should be kept in mind during the excessive sodium intake associated with the usual parenteral fluid routine.

The clinical signs of hypopotassemia are (1) loss of strength, (2) loss of energy, (3) increasing muscular weakness, (4) flaccid paralysis of the extremities, and finally respiratory paralysis with death. Potassium deficiency of varying degrees is much more common than is supposed. Therefore, it is wise to consider its importance, especially in postoperative care and when employing common parenteral fluid therapy.

*Taylor, Ross V.: Potassium in Electrolyte Balance, J. Michigan M. Soc. 49:793-796 (July) 1950.*



### **Burns in Atomic Warfare**

The atomic bomb explosion is accompanied with the release of enormous quantities of kinetic energy. At least 80 per cent of this energy is in the form of ordinary heat, commonly recognized as infra-red, visible, and ultraviolet radiation.

The temperature in the immediate vicinity of the blast may rise to several million degrees. The actual importance of these intense temperatures has been obscured by the prominence given to the mysterious gamma and neutron radiation.

There is no doubt that the radiation hazards from atom bomb explosions are very real. Nevertheless, the

importance of the thermal injury should be stressed. In preparation for atom bomb attacks, authorities should be aware of the potentialities of the thermal injury problems.

In a bomb of the Hiroshima type the most intense thermal radiation is in the area beneath the air burst (hypocenter) out to approximately 1500 yards. In the outer zone, from 1500 to about 4000 yards, severe burns are caused by the large amounts of radiated heat.

The outer zone represents an area of roughly 14 square miles compared to the approximate  $2\frac{1}{2}$  square miles of the inner zone. The concentration in the outer zone certainly would be heavy. Therefore, casualties will be found in large numbers. The numbers of burn casualties will tax all preparations authorities are likely to be able to provide.

The burn from explosion is similar in most respects to the ordinary burn. The main difference is that energy is imparted to the skin in an exceedingly short, rather than a longer, period of time.

Atomic flash burns also resemble ordinary burns as regards depth of skin destroyed. They may be superficial or deep. The atomic burn may be extremely painful.

Secondary burns are produced by flame damage from spontaneous ignition of clothing or by direct contact with flame encountered in escape from burning buildings. Burns with associated injury should be expected in any atomic attack. The associated injury is related to the blast effect of the bomb, with multiple lacerations and glass wounds from flying debris and ordinary skeletal trauma.

From a surgical point of view the seriousness of this associated injury is twofold: (1) Such additional trauma increases the severity and incidence of shock because of accompanying blood loss. (2) There is likelihood of greater incidence of serious infection.

Treatment is built around five basic considerations: (1) Relief of pain, (2) emergency dressings, (3) prevention and treatment of burn shock, (4) salt and water requirements to ensure adequate urinary

output, and (5) the most feasible antibiotic therapy to aid in the prevention of infection.

Most superficial flash burns involve the hands and face. These can be very painful. Relief is obtained with medication and dressings.

With the modern atomic bombs the burn problems will be magnified many times. The intensity of heat and the area involved will be greater. In planning of any kind of a defense these factors should be kept in mind.

Evans, Everett Idris: *The Burn Problem in Atomic Warfare*, J.A.M.A. 143:1143-1146 (July 29) 1950.



### Sunlight vs. Skin Carcinoma

It has been suggested that sunlight plays some part in the etiology of carcinoma of the exposed surfaces of the skin. A series of studies was made to learn more about the suggested relationship. The conclusion was reached that, "sunlight is by far the most important carcinogenic factor when repeatedly encountered in erythema-producing quantities in the racial stocks and hereditary complexion patterns of Irish-Scotch-English ancestry, including probably the blue-eyed North Europeans and possibly all homozygous blue-eyed persons."

Of a group of 100 persons with histologically proved carcinoma of the exposed surfaces of the skin 13 had brown eyes and 87 had eyes of light color other than brown (blue-eyed group). There were proportionately more males in the blue-eyed group than in the brown-eyed group.

Of the brown-eyed group only 46 per cent were "burned" as compared with 83 per cent of the blue-eyed group. In at least 50 per cent of the entire group both parents were light eyed while the rest had one light-eyed parent. No patient with two brown eyes gave a family history of carcinoma of the skin, and only 4 with one brown-eyed parent gave such a history. On the other hand, 21 who gave a family history

of carcinoma of the skin had 2 blue-eyed parents.

The lineage of two thirds of the carcinoma group was traced to England, Ireland, and Scotland. Observations made on the 100 patients with carcinoma of the exposed skin surfaces suggest that the more brown-eyed inheritance a person possesses, the better protected he is from the carcinogenic rays of the sun.

Blue-eyed children of blue-eyed parents are, in general, the most susceptible as a group. However, many of these are capable of tanning with-

out repeated burning and thus acquire a fair degree of immunity.

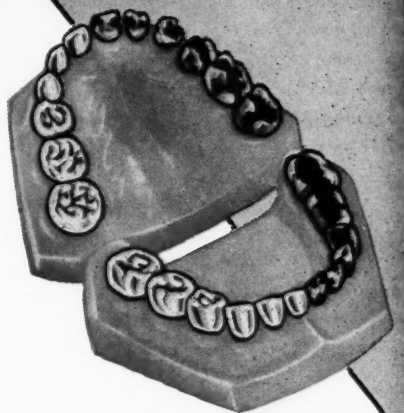
An important racial factor is the fact that natives of the British Isles and their descendants, particularly when blue-eyed, often exhibit an almost complete inability to acquire and retain a thick enough stratum corneum to protect them from rays of carcinogenic wave length in the amounts encountered in such regions as Texas, Arizona, Southern California, and Australia.

There are certain racial stocks and hereditary complexion patterns in which sunlight is not an important

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Crowns, 30c apiece. Introductory assortment of 100 in permanent plastic box, 30.00. Box alone, \$1.50. Space Maintainers, 75c dozen (6 sizes).

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factor in skin carcinogenesis. These include (1) the Negro race, (2) the Oriental race, (3) probably the Mexican and Mediterranean races, and (4) possibly all homozygous brown-eyed persons.

Hall, A. A.: *Sunlight and Skin Carcinogenesis*, Arch. Dermat. & Syph. 61:589-611 (April) 1950.

## Contra-Angles



### The AMA Spends Another Half Million

Back in September we raised a voice chiding the American Medical Association for spending a million dollars in an advertising campaign during war time. It looked like poor public relations and it looks worse in retrospect. Many members of the AMA have expressed the same opinion. Some physicians have pointed out that the AMA program was itself *compulsion*. Members were compelled to contribute \$25 each to the campaign fund. It was in no sense a voluntary offering.

Since the November elections someone suggested that the AMA could establish more favorable public relations by showing the public that the organization had a positive as well as a negative program. Consequently, the AMA has announced an appropriation of \$500,000 from the National Education Campaign Fund to aid the medical schools of the country. That is fine and statesmanlike. Here is the ringing statement announcing the establishment of the fund to help medical education: "There is growing public awareness that Federal subsidy has come to be a burden, not a bounty, for it is bringing intolerable increases in taxation, and is dangerously increasing Federal controls over our institutions.

"American medicine feels very

# SIMPLICITY is the key

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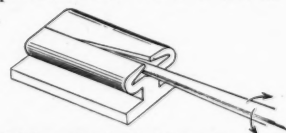
NEY  
GOLD



W

HILE prosthetic appliances designed according to the principles laid down by Dr. Herman E. S. Chayes must meet extremely high standards for precision, the basic technic is neither unduly complicated nor difficult to learn. Advantages to the patient . . . in esthetics, comfort, conservation of abutments and tissues and service life of the appliance . . . suggest much more extensive use of this fine type of restoration.

The J. M. Ney Company has placed its nationwide sales and technical facilities at the service of dentists and technicians interested in wider application of Chayes methods. Your Ney Technical Representative is now your NEY CHAYES consultant as well, and is prepared to demonstrate the use of NEY CHAYES Precision Attachments and explain their many advantages in simplified technic and oral performance. Write direct to The J. M. Ney Company, Hartford 1, Conn.



By means of the convenient Adjusting Tool the occlusal end of the male portion is readily opened to just the right degree for adjustment or additional retention without disturbing the re-seating of the case.

Case photographs from "Movable-Removable Bridgework," McCall & Hugel, by special permission of the publishers.

11NY50

strongly that it should not seek Federal aid for medical schools, until all other means of financing have been exhausted. The Board of Trustees announced yesterday its belief that funds for this purpose could be obtained from private sources—and as practical evidence of our sincerity of purpose, this appropriation has been made as the nucleus of a fund which we hope will be greatly augmented by contributions.

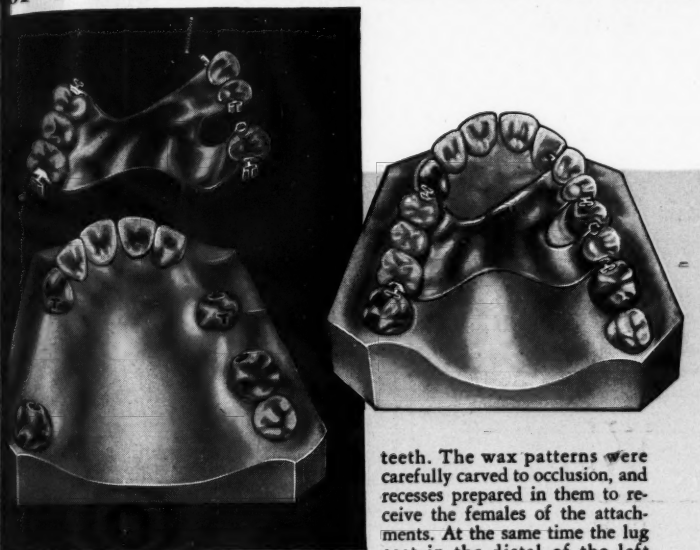
"The Board hopes that this action

will become a stimulus to other professions, industries, businesses, labor groups and private donors to contribute to this very important cause of protecting and advancing the interests of medical education and the public health.

"The American Medical Association urges all its members to contribute individually to this cause, and we hope that doctors will take the lead in securing contributions."

The public will like this gesture!

# NEY CHAYES technic



teeth. The wax patterns were carefully carved to occlusion, and recesses prepared in them to receive the females of the attachments. At the same time the lug seat in the distal of the left

Replacement of the missing teeth on this upper was esthetically accomplished with a Movable-Removable bridge. Efficient function was restored with maximum comfort to the patient. Abutment and tissue health was maintained with the application of sound principles to the design and construction of the case. This is, in fact, an ideal restoration from both the operator's and patient's viewpoint.

The abutments are the upper right cuspid and second molar, and the left second bicuspid and first molar. The original plan for the abutment preparations was made on an accurate study model, assuring sufficient space in the castings to accommodate the females within the normal circumference of the

second bicuspid was prepared, ensuring its parallelism with the attachments. The three-quarter crowns in the cuspid and bicuspid and the full crowns on the molars were cast in Ney-Oro B-2.

In this case a single wide bar across the palate effectively distributed the load between abutments and tissues. Thus the abutments alone were not required to carry all of the stresses resulting from the forces of mastication. The four Ney Chayes Attachments plus the accessory lug in the bicuspid esthetically provide retention, at the same time allowing the minute movements necessary for preservation of the abutments and tissues in sound health.

This bridge has many years of useful life ahead of it.

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## The President is a Man

It is easy to forget that the President, in his exalted position in the White House, is a man. He is subject to abuse and to adulation. It is easy to take both in stride but when his darling daughter is affronted he may lose whatever aplomb he may have and react as a father—an irate father.

Miss Margaret Truman is a singer. How good she is I would have no way of knowing, having no skill whatsoever in this field. People who call

themselves critics say that she is not too talented. After one of her concerts or recitals or whatever singers do in public, a music critic said that Miss Truman was on the flat side. Her father, the President, without advice of counsel, wrote a longhand angry letter to the critic threatening to punch his nose and to strike him in parts unmentionable. The letter was made public and the press screamed that such a threat by the President of the United States was beneath the

dignity of the high office and was good reason for impeachment. Poppycock.

It's a sad state when a man, even if he is sixty-six, can't threaten his daughter's detractor even if the offender is thirty years his junior. If President Truman's impulsive letter proved anything it proved that he is a man, a father, a normal human being, and therefore subject to temper tantrums and irritations. He is like the rest of us. We are all fools on occasion.

President Truman's letter has been published as follows: "I never met you but if I do you'll need a new nose and plenty of beefsteak and perhaps a supporter below. Westbrook Pegler, a guttersnipe, is a gentleman compared to you. You can take that as more of an insult than as a reflection on your ancestry." Mr. Pegler, who had nothing to do with this incident, was included by association in the President's letter for the good reason that H. S. T. was venting his spleen and Mr. Pegler is a splenic irritant of the first category to many people. Damning by association is like getting mad at your wife and including all her relatives, far and near, in the denunciation.

In reply Mr. Pegler drew another innocent bystander into the altercation, Mr. Bernard Baruch. The published version of Mr. Pegler reads: "It is a great tragedy that in this awful hour the people of the United States must accept in lieu of leadership the nasty malice of a President whom Bernard Baruch in a similar incident called a rude, uncouth, ignorant man. Let us pray."

These angry letters of name calling and tongue-sticking-out prove nothing except that regardless of how high one reaches he still remains a human being with temper, antipathies, irrelevant identifications. We have all been guilty of the same kind of unflattering conduct and if we seek excuses we must write it off as emotionalism. And without some emotion we would be lifeless clods. The skill is to control emotionalism and to use it in properly directed channels. Mr. Truman has that discipline to acquire.

My first reaction upon reading Mr. Truman's outburst was to think that

## CLINICAL AND LABORATORY SUGGESTIONS

(See pages 76 and 77)

### Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST  
708 Church Street  
Evanston, Illinois

From: \_\_\_\_\_

Subject: \_\_\_\_\_

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

\$10 will be paid on publication for each suggestion that is used.

a man with so little self-control should never occupy the office of the Presidency. (He is the one, by the way, who has the authority to decree when the atom bomb will be used.) But upon reflection I recalled that there were no emotional standards imposed upon the office of President. It has been occupied by manics, by depressives, by paranoids, by schizoids, and the whole galaxy of psychopathic personalities. What the people want is a man on the job and if they have a man they have someone subject to all manner of behavioral traits, both good and bad. Mr. Truman's trait of impetuous letter writing is an unpleasant behavioral trait that is readily understood by the public and has probably harmed his public standing more than most of his executive commissions and omissions.

If your daughter or mine (and I have three) was subject to ridicule and abuse we would probably act the same: offering to punch the detractor in the nose. I have done it, but thank God, my juniors did not call my bluff.

### Have Fun While Your Teeth Decay!

From the *Industrial Sports Journal* we have uncovered another health item that may account for some of the dental caries in the country. Some time ago we mentioned the candy and coke bars in the elementary schools in the country from which originate part of the sugar for degradation in the mouth which is a precursor of dental caries. Now we find that industry has a "\$16 Million Annual Take from Bottled Drinks." The take, by the way, does not go into the pockets of the company officials, the stockholders, or the employees. It pays for employe sports and recreational programs. Have fun while your teeth decay!

My informant, writing in the *Industrial Sports Journal*, says: "Of industry's approximately \$450 million annual investment in sports and recreation activities for employes, approximately 3.6 per cent . . . which is a very respectable sum in dollars . . . comes out of the cooler. The cooler, that is, that keeps Coca-Cola and



other soft drinks in palatably attractive condition. The business of making and distributing these drinks to industrial employes grosses about \$75 million a year, on which Industry's net profit is approximately \$16 million.

"The industrial employee's composite thirst for soft drinks and other refreshers such as candy is enormous. Coca-Cola (the leading and only company on which figures are available) annually sells 1,224,000,000 bottles of its product to this market through more than 85,000 dispensing machines. And on each case of Coke thus distributed, Industry receives approximately 40c gross and 25c net profit, most of which it assigns to employe clubs to help defray the cost of sports and recreation activities, according to Gene Hoyne of Western Coca-Cola at Chicago. The net take varies: the 25c case figure is average."

In the frequent tirades against sugar in this department it may appear that I am an enemy of all food—fun and an exclusive drinker of goat's milk and an eater of raw liver mixed with wheat germ and ascorbic acid. That is a canard!

People should not live for their teeth alone and forego all pleasures of the flesh to keep caries free. We are merely suggesting that they eat a little more wisely: more protein, less refined sugar; more natural foods, fewer denatured ones.

Candy, coke, and cigarets are bad because they are used in substitution for proper foods. If people ate the nutritious and protective foods first and then took their three C's little harm would come to their general nutrition and not as much harm to their dental tissues.

It will surprise some dentists to see cigarets listed under the category of foods. I trust that this will not be discovered by the cigaret manufacturers or a new slogan will be aborning. Cigarets are foods in the sense that they raise blood sugar values and in so doing act as substitutes for food. The fatigue state that is part of the syndrome of hypoglycemia can be relieved by smoking a cigaret. That is a way of burning the furniture to

keep the house warm, by depleting the body reserves. Hypoglycemia should be relieved by taking food—proper food, a glass of milk, fruit, a piece of cheese, for example.

By referring to the latest text on

medicine by Harrison (*Principles of Internal Medicine*, Blakiston, 1950) we find: "Hypoglycemia is commonly related to improper dietary habits and can usually be diagnosed by the following criteria: the subjects usual-

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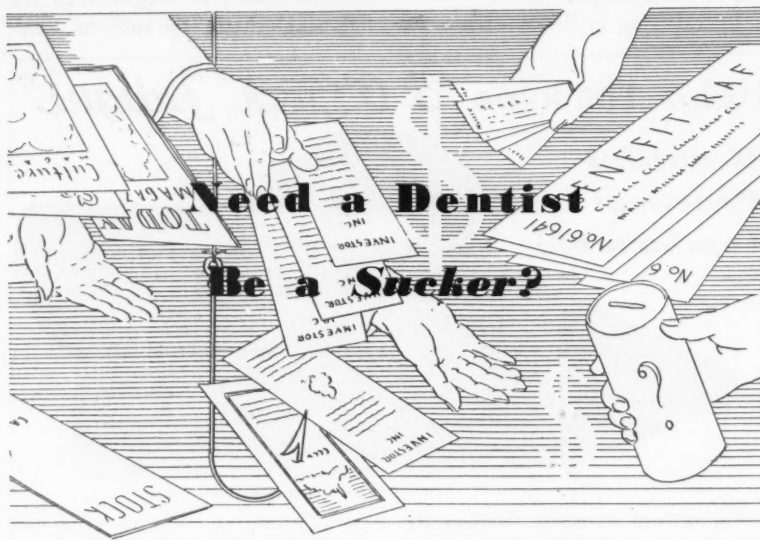
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## In your ORAL HYGIENE this month



"Need a Dentist Be a Sucker?" Doctor Harold Gluck explains how to say "No" at the right time in a number of different circumstances. It's an art to do this without running the risk of offending the solicitor—who may be a patient.

★ ★ ★

"Must Dentists Be Half Trained?" Doctor Arthur S. Dunn asks this question—and answers it—in a penetrating analysis of present-day dental education. He suggests changes in college curricula and gives sound reasons for these changes. His article is worth serious consideration not only by dental educators but by every dentist interested in the progress of his profession.

★ ★ ★

Hypnosis is still a rather controversial subject, but the story told in a series of pictures, "Extraction Under Hypnosis," will interest even the most skeptical. The hypnotic state was induced by a psychiatrist, Doctor Joseph Dimont; the operation was performed by Doctor E. V. Elder.

★ ★ ★

Doctor Maurice J. Teitelbaum, a regular contributor to dental magazines, urges other dentists to write for publication. To help them, he gives directions for assembling material, making outlines, doing the actual writing, and submitting manuscripts

to editors. We hope many dentists will read—and heed—Doctor Teitelbaum's advice to "Write That Article." Many good ideas are lost because they are not recorded in print.

★ ★ ★

Doctor C. W. Yorke, dentistry's outstanding bridge player, has added another trophy to his collection. He and his partner eliminated 191 other competitive pairs in four days' play at Columbus to win the Master Pair World Championship. You will enjoy his story as told by Gordon Duncan.

★ ★ ★

Do you ever wonder what your youngest patients are thinking about you while you're working on them? In Seattle, a poll among school children produced surprising opinions.

★ ★ ★

A New York dentist, Doctor Henry Fischer, disagrees with the idea of "retiring" to a home practice. Having practiced at home for many years, he wants to "taper off" via an office practice. His reasons are logical, too.

★ ★ ★

Does your temper flare or smoulder? Doctor Harry C. Peake claims that "Anger Is Good for Dentists"—but suggests that it be directed, not allowed to shoot wild.

★ ★ ★

All of the regular monthly departments and features, of course.

ly ingest large quantities of carbohydrates and relatively little protein. The attacks are prone to occur two to five hours after the preceding meal and do not occur within an hour after eating. During the seizure faintness, anxiety, sweating, giddiness, palpitation, choking sensations, and vague precordial discomfort are common . . . The seizures can usually be prevented by the use of a diet which is low in carbohydrate and high in protein, administered in small frequent feedings. This disorder is very common and is frequently misdiagnosed either as 'organic heart disease' or as 'neurosis'."

So the case against candy, coke, and cigarets is based on more than the effect of the three C's on the dental structures. Use all three, if you wish, after the basic food requirements have been met.

—E. J. R.

## Labial Diphtheria

GEORGE S. RIDDELL, D.P.H.,  
Aberdeen, Scotland

### Separate Localization Rare

Involvement of the buccal mucous membrane, the tongue, and the lips commonly arises from failure to arrest the spread of the membrane in the late severe faucial diphtheria. Reiche<sup>1</sup> records 49 examples of lesions of the lips among 7,314 fatal cases of severe faucial diphtheria in Hamburg. Instances in which labial membrane has occurred as a separate and distinct localization are much less frequent although a labiofaucial infection and a nasolabial case have been reported.

### Conclusion

Although not purporting to represent a complete survey, the cases studied allow the conclusion that membrane may appear on the lips in the following circumstances: (1) as a direct extension of membrane in late severe faucial diphtheria, (2) as an occasional accompaniment of nasal or faucial diphtheria, and (3) as an exceptional phenomenon in the absence of infection of the nose and throat.

<sup>1</sup>Reiche, F.: Z. Clin. Med. 81:199, 1914.

## The Cases

1. Forty-six cases of labial diphtheria were observed among British prisoners of war in a Japanese prison camp on Singapore Island, constituting part of an extensive epidemic of 940 cases of diphtheria, both respiratory and nonrespiratory.

2. In 24 cases no focus of diphtheria other than the lips seemed to exist.

3. In four of the early examples negative cultures were obtained from the nose and throat.

4. An associated localization was present in 22 patients, the second focus being an anterior nasal rhinitis in three, faucial diphtheria in eight, nasofaucial diphtheria in four, and a coexisting cutaneous diphtheritic lesion in seven.

## The Predisposing Lesion

1. The lesion, which was present for days or even weeks before the advent of the diphtheritic disease, comprised the following symptoms: (1) cheilosis, (2) maceration, and (3) fissuring at the corners of the mouth, and first brought to the notice of the medical profession a probable deficiency state, "angular stomatitis."

2. The labial manifestations of hyporiboflavinosis were of extreme frequency and often considerable severity among the prisoners.

3. Severe cases frequently showed some heaping up of macerated whitish epithelium at the corners of the mouth. This bore no resemblance to a true labial membrane.

## Bacteriology

1. In the conditions prevailing in a prisoner-of-war camp complete bacteriologic finality was not possible.

2. Single cultures of the *Corynebacterium diphtheriae* were taken from the lips in 25 cases and 19 of these proved positive.

3. In four cases with a coexisting respiratory localization and in four with a concomitant cutaneous lesion cultures were also taken from the second focus of infection, in each case with a positive result.

4. The characteristic labial lesion and the isolation of the specific organism in 19 cases provide ample evidence that the cases were instances



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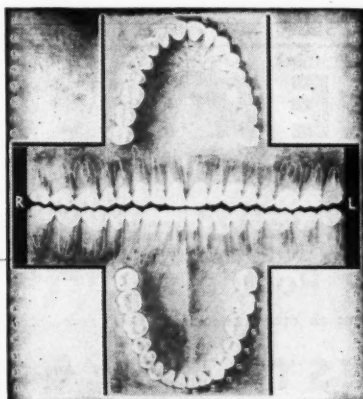
Not rubbery—adapts to base plate like compound—ideal for stabilizing shellac base plates—resists distortion from heat and pressure—wax adheres to it—molds are super clean after boiling out.

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of true diphtheritic membrane formation on the lips.

### **The Clinical Picture**

1. A distinctive, pearly white or faintly yellowish, raised, glistening membrane, firmly adherent, covered as a rule the outer two-thirds of the upper and lower lips on each side, extending to meet in the midline.

2. The membrane was always most pronounced at the corners of the mouth, but only exceptionally was it unilateral. So striking was the clinical picture that the diagnosis rarely, if ever, gave any difficulty to unit medical officers even when seeing a case for the first time.

3. The existence of a second focus of infection was without apparent influence on the appearance of the labial localization.

4. Toxemia was absent or unimportant in the purely labial case. Cervical and submental adenitis of slight degree was present in most instances.

5. In the absence of therapeutic antitoxin the membrane separated in seven to ten days to leave an area of superficial ulceration which healed readily without scarring.

6. Where serum was given in a purely labial case (two instances) the membrane separated within forty-eight hours.

7. In at least seven of the twelve labiofaucial cases it seemed possible, if not probable, that the lips had been the primary focus, the leap from lips to fauces constituting the great danger of the labial infection.

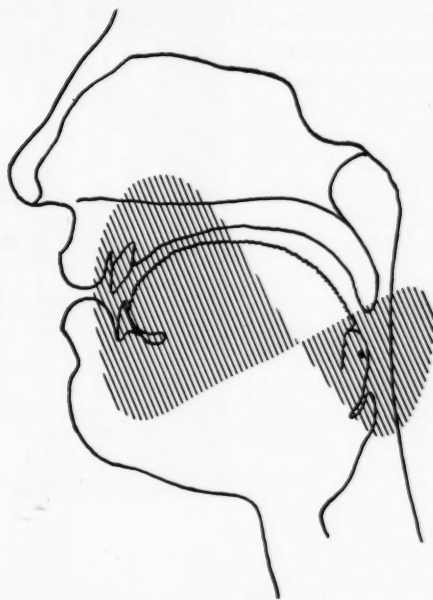
8. It must be emphasized that in all these cases the two lesions were anatomically separate and not due to direct extension of the membrane from one area to the other.

### **End Results**

1. No fatalities occurred in the group of 24 purely labial cases nor did the slightest indication of post-diphtheric neuritis or clinical myocarditis appear in any instance. This localization of diphtheria *per se* would therefore seem to be an extremely suitable predisposing lesion.

2. The outcome of events in cases  
(Continued on page 92)

Local treatment  
of gingival infections  
with the *newest*  
of the broad-spectrum  
antibiotics



# CRYSTALLINE Terramycin TROCHES

Each troche provides 15 mg. of Terramycin in a pleasant-tasting, mint-flavored sugar base.

Particularly valuable in Vincent's infection, and as an adjunct to dental procedures in the treatment of pericoronitis and other mouth infections caused by a wide range of Gram-positive and Gram-negative bacteria.

## *Administration and Dosage*

Daily dosage of 8 to 16 troches has been found adequate for most infections. A troche is placed in the lower gingivolabial groove and permitted to remain without sucking or chewing until completely dissolved.

**Supplied:** On prescription, in packages of 24.



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with a double infection was governed by a major localization.

3. The three nasolabial cases had no fatalities, sequelae, or complications, and all seven cases with labial membranes and cutaneous diphtherial involvement made uneventful recoveries.

4. The twelve labiofaucial cases had no fatalities, but clinical evidence of myocarditis (persistent severe tachycardia) appeared in two instances, both of which subsequently developed neuritis.

5. Neuritic phenomena appeared in four other cases: (1) paralysis of accommodation in one, (2) palatal paralysis in two, and (3) palatal palsy plus peripheral motor neuritis in one.

### Treatment

The usual regimen of strict rest applicable to cases of diphtheria was not carried out as far as possible. This aspect of the management of the cases was satisfactory and probably accounts for the low incidence\* of complications despite the lack of antitoxin.

Therapeutic antitoxin was available for five cases only: two purely labial, and three labiofaucial. Of the latter, two escaped without complications and one developed postdiphtheric neuritis.

### Summary

1. In 24 of the cases observed no focus of diphtheria other than the lips seemed to exist. In 15 there was an associated respiratory localization. In 7 a coexisting cutaneous focus of infection was present.

2. The infection of the lips following deficiency of riboflavin in the diet depended on a specific predisposing lesion: (1) Fissuring at the angles of the mouth, and (2) cheilosis of the vermilion part of the lips.

3. Labial diphtheria alone or associated with anterior nasal or cutaneous diphtheria was unattended by mortality, complication, or sequelae. The presence of a faucial infection brought with it the dangers and complications of that localization.

4. As purely labial diphtheria was unassociated with either myocarditis

or neuritis, the cases reported failed to provide an opportunity of observing the cardiac and neuritic complications of diphtheria as seen in non-respiratory localizations, and are chiefly of interest because they represent a series of a distinctly rare localization.

Adapted from *British Medical Journal* 4657:818-819 (April 8) 1950.

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### Dentistry and the Atomic Energy Program

(Continued from page 72)

sons raised in a fluoride area to take up fluorine could be determined.

4. It might be possible to screen patients and determine which ones will benefit from topical application of fluoride by testing their enamel for its ability to take up fluorine.

### Use of Geiger Counters

Because they are used to detect radiation in both living beings and tissue specimens Geiger counters are

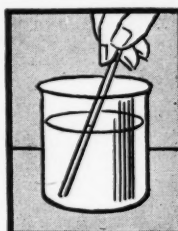
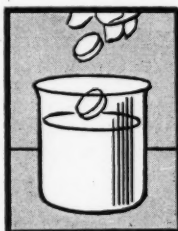


Just two Parker's Germicidal tablets dropped in a pint of water and stirred, quickly disintegrate to produce a 1:1000 solution of stable, active germicidal Solution — A. D. A. approved. Then, instruments need only be washed free of pus, blood, protein material or soap and immersed in the germicidal solution for 15 minutes to achieve safe and complete chemical disinfection.

## OTHER OUTSTANDING ADVANTAGES

- **ECONOMICAL** — One bottle of 80 tablets (\$6.50) makes five gallons of germicidal solution costing \$1.30 a gallon . . . 16¼¢ a pint.
- **TIME-SAVER** — No time lost waiting for water to boil or instruments to cool.
- **SPACE-SAVER** — No bulky bottles of liquid to store — or to pour.
- **NON-CORROSIVE** — No anti-rust tablets necessary.
- **NON-TOXIC, NON-IRRITATING** — Makes an excellent hand sanitizing rinse for use between patients, or for the cleaning and disinfection of head rests, arm rests, bowls, cabinet drawers, etc.

Because they fill the long-felt need for quick, effective, COLD STERILIZATION of surgical instruments at low cost — Parker's Germicidal Tablets are routinely used by leading Dentists and Physicians throughout the country. Available through your Dealer or use handy coupon below.



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Equivalent to 5 gallons **\$6.50**

Parker's Germicidal Tablets are manufactured by A. J. Parker Co., Pharm. Chem., Phila., Pa. Distributed to the Dental Profession exclusively by B. G. HATCH CO., Brooklyn 1, N. Y.

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the most generally applicable instruments in radiobiology. They are used in many ways: 1. To trace the circulation of the blood a counter is placed at the particular point. The counter is shielded from all other areas, and readings are taken at intervals until the radioisotope reaches the area in peak concentration. This circulation time is compared with that for the normal extremity.

2. Tracer doses of radioiodine are useful in the diagnosis of thyroid disease because a counter placed over the thyroid gland will register the

amount of radioactivity in that area. From this the ability of the gland to concentrate iodine is calculated and the internist learns more exactly the state of activity of the thyroid tissue.

3. In the case of an experimental animal the tissues can be removed and sections or extracts examined for radioactivity in sensitive radiation meters.

### Use of the Radioautograph

The most precise method of localizing a radioisotope, which can be applied only to tissue sections, is the

radioautograph. In this method the radioactivity of the isotope in a tissue specimen makes its own exposure on x-ray film.

**Process**—The exposure of the emulsion is made possible by the fact that when the unstable atomic nucleus of a radioisotope disintegrates it releases energy in the form of radiation. These radiations are different for each isotope. They differ in energy, measured in electron volts, and they differ as to type.

The alpha particle is the least penetrating type, the beta particle is somewhat more penetrating but still comparatively weaker than the penetrating gamma ray, which resembles the x-ray. When the nuclear emissions radiate from their locus in the tissue and go into the x-ray film they hit some of the silver grains and render them developable.

### Specific Dental Applications

1. It is known that protein, ascorbic acid, nicotinic acid, and many other essential food factors are necessary for (1) normal wound healing, (2) growth, (3) healing of gingival and alveolar bone lesions. By labeling compounds with radioisotopes, which has been accomplished for several of the vitamins, hormones, and amino acids, it is possible to trace these substances through the body; for example, into a healing tooth socket after extraction.

2. Organic chemists skilled in microsynthesis have already supplied hundreds of radioactive compounds and the ingenuity of the chemist is increasing daily. Procaine, penicillin, estrone, testosterone, nicotinic acid, urea, glycine, alanine, and pentobarbital are substances listed.

3. The United States Atomic Energy Commission assures availability of radioisotopes at nominal cost, and in the case of cancer research will supply them free of production costs. The Commission will also aid in finding qualified consultants for particular types of research.

### Conclusion

(1) Dentists must complete the picture and ensure full utilization of  
(Continued on page 96)

See second cover

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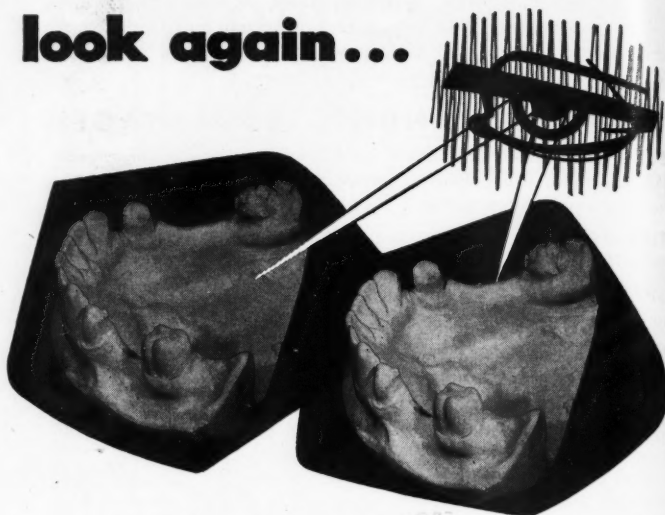
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